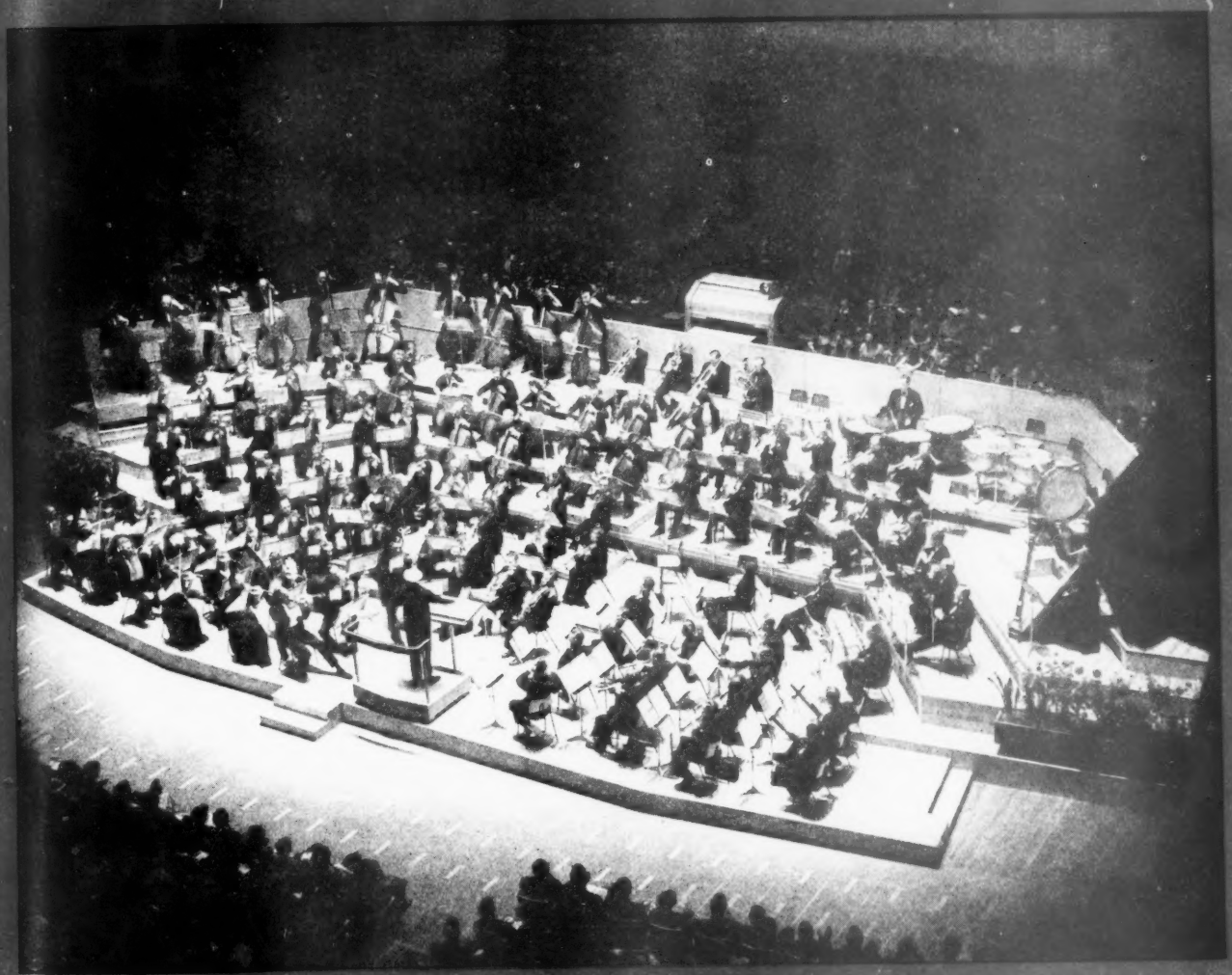
THIRD SERIES VOL 59 NUMBER 2 DECEMBER 1951

THE JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

66 PORTLAND PLACE LONDON W1 · TWO SHILLINGS AND SIXPENCE



Leopold Stokowski conducting Stravinsky's 'Rite of Spring' in the Royal Festival Hall

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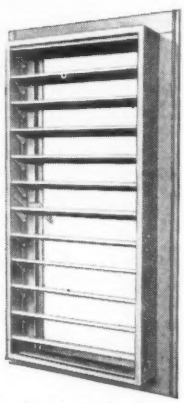

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The Honorary Associateship

The Council have invited the Lord Bilsland of Kinrara, M.C., D.L., J.P., LL.D., and Dr. Nikolaus Pevsner, M.A., Ph.D., Hon. A.R.C.A., Hon. F.S.I.A., to accept nomination for election to the Honorary Associateship.

Exhibition of Work of Mr. W. H. Ansell

An exhibition of water-colours, etchings and drawings by Mr. W. H. Ansell, M.C., Past President, R.I.B.A., will be held at the Institute from 15 January to 9 February 1952. The drawings were made in England, France, Italy, Spain, Holland, Belgium and Germany, and cover a period of 55 years. The earliest are a couple of water-colours painted in Lisieux in 1896, and the latest a set of drawings made in Burgundy in 1951. The subjects are architectural, but the various treatments are pictorial. Many of the pencil drawings, as will be obvious from their technique, are studies for etchings.

The Exhibition will be open from 10 a.m. until 7 p.m. on Mondays to Fridays, and from 10 a.m. to 5 p.m. on Saturdays.

The Government's Housing Policy

Following the statement on the government's housing policy made by the Minister of Housing and Local Government in the House of Commons, the Ministry issued Circulars 70/51 and 73/51. These will have reached the salaried architects of local authorities, but for the information of private architects we have reprinted the texts of the Circulars in Practice Notes (page 66). Circular 70/51 deals with new house designs and indicates the methods by which it is recommended that the superficial areas of houses built by local authorities can be reduced without reducing room sizes. Circular 73/51 covers houses to be built under licence for owner occupiers, and in it the Minister states that local authorities may issue licences for privately built houses up to 50 per cent. of their allocation.

In answer to questions at a press conference the Minister stated that the development charge remained, though consideration would be given in due course to the operation in general of the Town and Country Planning Act. For the moment he was advised that there was enough land ripe or nearly ripe for development to provide sites. He also pointed out that the ratio was permissive and not mandatory, and that local authorities would have to be guided by a study of needs in their areas in settling the proportions of private to local authority licences.

R.I.B.A. Dinner

The Council have decided to revive the former custom of holding a dinner, and the next is fixed for Thursday 20 March at Grosvenor House. Tickets will be 32*s.* 6*d.* each exclusive of wines and cigars. Other arrangements, such as the list of speakers, have not yet been decided and will be announced in due course. Application for tickets should be made to the Secretary, R.I.B.A.

Before the war the dinner was invariably held in the Henry Florence Hall at the R.I.B.A., an arrangement which had an obvious great advantage in that the Royal Institute was entertaining its guests in its own home. Unfortunately, the capacity of the hall—330 diners—was, in later years, insufficient to contain the large number of members who wished to attend, in addition to the official guests. When the last dinner was held there in 1947, several hundred applications by members for tickets had to be refused. The Council were reluctant to hold the dinner elsewhere than in the R.I.B.A. building, but have decided that this is preferable to excluding the large number of members who would wish to take part in what has always been a most important social occasion in the life of the Royal Institute.

The Annual Reception

The Royal Institute's Annual Reception will be held at 66 Portland Place on Friday 23 May. Tickets for members and their guests will be 15*s.* each. In addition to the refreshments usually provided, there will be a bar at which members may buy drinks for themselves and their guests. Further details will be announced later.

New Films

Several films have recently been produced which are likely to be of particular interest to architects. Two of these are reviewed in this issue, and appraisals of others will be published shortly. 'Houses in the Town', made by the Central Office of Information in collaboration with the Ministry of Housing and Local Government, will be thought by many to be the best film yet made on the subject of housing layout. Starring in the film are Professor W. G. Holford [*F*], Frederick Gibberd [*F*], and Robert Matthew [*A*], who give their views on the present trends in urban development, illustrating them by the use of models.

Another film which will appeal to architects is one on Cornish granite. This material has not previously been the subject of a film, and is of topical interest because there are several sequences in it showing in detail the construction of the new South Bank wall.

The silver steeple cup which has been presented to the R.I.B.A. Council Dinner Club by Mr. W. H. Ansell, Past President. The presentation was made at a luncheon of the Club held on 9 October. The cup was specially designed and made by Mr. Leslie Durbin. Mr. Ansell chose the steeple of Wren's church of St. Vedast, Foster Lane, because he has always had a special admiration for it

Conference on Hospitals

The Nuffield Provincial Hospitals Trust recently invited the members of the R.I.B.A. Hospitals Committee to hold a special week-end session devoted to the consideration of hospital research from the point of view of the hospital architect. The session was held during the week-end 14-16 December at Magdalen College, Oxford, and in addition to members of the R.I.B.A. Hospitals Committee, the President, Mr. A. Graham Henderson, A.R.S.A., attended in a personal capacity. The Trust has for some years been concerned with research into the hospital services, both broadly into the role and function of the hospital in the community, and in more detail into the actual design and operation of the hospital itself. In particular, the Trust has sponsored, jointly with Bristol University, an investigation into the functions and design of hospitals, the report on which is due to appear in about a year's time. The proceedings of the Conference were private.

Use of Ordnance Survey Maps : Renewal of Licences

Ordnance Survey maps are Crown Copyright, and their unauthorised reproduction in any form constitutes an infringement of the Copyright Act, 1911. All members who have need to copy Ordnance Survey maps in their own offices should obtain a licence for this purpose from the Director General, Ordnance Survey. Licences are available to cover either (a) hand tracings only, or (b) both hand tracings and mechanical reproductions, the respective fees being 5*s*. and 10*s*. per annum for each partner, director or separate office of a firm, whichever is the greater number. Fees may be paid up to five years in advance if desired.

The hand tracing licences issued for a five-year period when the scheme was first introduced in 1947 expire on 31 December 1951, and should be renewed within one month of that date. Members wishing to renew such licences, or to obtain a licence for the first time, should write to the Director General, Ordnance Survey Office, Chessington, Surbiton, Surrey, stating the type of licence required and enclosing the appropriate fee and previous licence if held. Remittances should be made payable to 'Ordnance Survey Department'.

The Royal Academy Winter Exhibition

The Royal Academy Winter Exhibition, which opens as we go to press, is entitled 'The First Hundred Years of the Royal Academy'. The Royal Institute have lent a number of architectural drawings for this exhibition. They include four drawings of Cockerell's work, one of which is the magnificent perspective of the Royal Exchange, three of Hardwick's—his famous Great Hall at Euston, the coffee room of the Great Western Hotel and the Australian Bank—Barry's Bridgewater House, Sir Gilbert Scott's Gothic design for the Foreign Office, Elmes's design for St. George's Hall, Liverpool, Smirke's Carlton Club and Decimus Burton's Hyde Park Corner. The exhibition closes in March.

Death of Mr. H. Greville Montgomery [*Hon. A*]

We regret to record the death of Mr. H. Greville Montgomery [*Hon. A*], who has been very well known to architects as the founder, with his brother the late H. C. Montgomery, of the Building Exhibition and for his many benefactions to the Architects' Benevolent Society. He started the present series of Exhibitions in 1895 and built it up into an acknowledged public service to the building industry which is traditionally opened by a Minister of the Crown and visited by Royalty. This year the exhibition broke all records for size and number of visitors and has now become the largest building exhibition in the world. Mr Montgomery was for some years a Vice-President of the Architects' Benevolent Society and a most generous contributor to its funds. The architectural profession has good cause to remember him with gratitude. He had been in failing health for some time and the management of the Building Exhibition has been in the capable hands of his son Mr. Hugh R. G. Montgomery [*Hon. A*] and Mrs. Hugh Montgomery, both of whom are also maintaining the family interest in the activities of the A.B.S.

Course at York on the Repair of Ancient Buildings

On page 70 of this JOURNAL we give details of a two-week residential course which is to be held at York next September on the protection and repair of ancient buildings. It is being held by the Academic Development Committee of the York Civic Trust and will be under the direction of Dr. W. A. Singleton, M.A., B.Arch. [*A*], of the University of Manchester. A somewhat similar and most successful course was held this summer in London by the Society for the Protection of Ancient Buildings, for which applications greatly exceeded the accommodation available. From this last fact it would appear that there is a large demand for the specialised knowledge which is required for this class of work and therefore that the course to be run by the York Civic Trust will be welcomed, specially in the north of England. This demand is not surprising in view of the fact that large numbers of ancient buildings, particularly country houses, are coming into the hands of local authorities and public bodies and that present-day building practice is tending more and more to diverge from the ancient craft methods by which these old buildings were constructed. Indeed, the supply of craftsmen necessary for this work is lacking as much as that of architects possessing the required experience and knowledge.

The A.B.S. Competition

All the 57 designs submitted in this competition will be on view in the Foyer in the R.I.B.A. until 5 January. The awards will be received too late for publication in this JOURNAL.

Royal Incorporation of Architects in Scotland

Mr. K. Macrea, W.S., has been appointed Secretary and Treasurer of the Royal Incorporation of Architects in Scotland in succession to the late Mr. J. T. Middleton.

Christmas Holiday

The offices of the R.I.B.A. will be closed on Tuesday 25 December and Wednesday 26 December. The Library will be closed from Tuesday 25 to Thursday 27 December inclusive.

R.I.B.A. Diary

TUESDAY 8 JANUARY. 6 P.M. General Meeting. Announcement of Award of Prizes and Studentships. *Expression in Modern Architecture*. Frederick Gibberd, M.T.P.I. [*F*].

MONDAY 14 JANUARY. 6 P.M. Library Group. Identification of drawings by unknown architects or of unknown buildings.

TUESDAY 15 JANUARY TO SATURDAY 9 FEBRUARY inclusive. Exhibition of drawings, etc. by Mr. W. H. Ansell, M.C., Past President, R.I.B.A. (Monday to Friday, 10 a.m. to 7 p.m. Saturday, 10 a.m. to 5 p.m.).

Acoustics in the New Concert Halls

By W. A Allen [*A*]

LONDON, MANCHESTER AND BRISTOL all have been given concert halls again in this Festival year, which is as it should be, for all lost their homes for concerts in the war. The new Colston Hall had its reopening in the summer, and the Free Trade Hall last month; the Royal Festival Hall in London has, of course, been in the public eye since the Festival itself began.

Fortunately the design of these buildings has coincided with a great invigoration of acoustical studies in Britain. The new Acoustics Group of the Physical Society has been formed and has grown to a body of 300, representing all branches of acoustics. Research at the major laboratories has been very active and has reached a high place in the world picture of acoustical research. Behind this is a firmly established pattern of collaboration between British architects and scientists in building acoustics. All this made it possible to approach the acoustical problems of the new halls with a consistent view about the musical objectives of design and reasonable confidence about the way to attain them. The energetic interest taken in acoustics by the architects and owners of the halls has in turn enabled the subject itself to be advanced, through close adherence to recommendations and adequate facilities for subsequent study. Notes of a discussion on musical quality in concert halls which appear on pp. 47-51 show clearly the close links now formed between acoustical science, music and architectural design.

It had been hoped to include in this issue of the JOURNAL details of all three halls, but the material for the Free Trade Hall could not be prepared in time. It will be published as soon as possible. It has a special acoustical interest in its loudspeaker system, which is designed on a new principle giving exceptional quality.

The other two halls are described below. The material on the Royal Festival Hall has been prepared by Mr. W. A. Allen [*A*] and Mr. P. H. Parkin of the Building Research Station who, together with Mr. Hope Bagenal [*F*], were responsible for the acoustical advice. The notes on the Colston Hall were written by Mr. H. R. Humphreys [*A*], formerly of the Building Research Station and now of the B.B.C.

The Royal Festival Hall. The acoustical intentions in the design of the Festival Hall have been described in detail a number of times, and will be only briefly outlined here. Emphasis will be laid instead on some of the lessons learnt from the study of the Hall during its testing period and the first few months' experience in it.

The original musical objective in the design of the Hall was to have fullness of tone with adequate definition, for the discussion reported in the R.I.B.A. JOURNAL* showed that musicians valued these two factors highly. Of the two, they laid the greater stress on tone. In addition, blending and balance seemed important; blend being the impression of the music as a homogeneous body of sound, and balance the faithful relative strength of each orchestral department. All such characteristics necessarily vary from place to place in a hall, but it was a specific objective in this design to keep variation to a minimum. Very few people appreciate the extent to which the acoustics of a hall can vary from good to bad in the different parts of most halls.

Freedom from echoes was a natural requirement, and a low level of intruding noise was specified in relation to the noise from the nearby railway bridges.

In the result, the Hall has definition and clarity which exceeds all expectations; tone is quite full but it perhaps falls slightly short of an ideal for some music and some orchestras, considering the exceptional definition. Blend and balance are broadly satisfactory, but in these respects the Hall is sensitive to orchestral arrangement and performance. There is exceptional uniformity of quality over all seating positions. Intruding noise has been kept to a level probably lower than ever before, and contributes to the clarity and definition which is the Hall's outstanding feature. There are no significant echoes. The discussion reported in this JOURNAL reviews the musical quality of the Hall in detail.

Fullness of tone appeared to require a longish reverberation, and in view of the consequent risks to definition entailed by this it was felt that as much emphasis should be given to the development of definition as of reverberation. The chief measure taken to secure good definition was to rake both the orchestra and the audience areas relatively steeply, so that all instruments would have equally free sound paths to all audience positions. It is evident in the Hall that this has achieved its purpose, but two or three other factors seem to have contributed to enhance the clarity. The low level of intruding noise which has been provided helps definition unquestionably, especially in pp. passages. The fact that the orchestra has no big reflecting surfaces very close to it (see bottom picture on page 42) may also be contributing to the effect by leaving many first reflections to come along later than usual. The canopy over the orchestra (see top of page 42) assists the more distant upper seat positions. The section in Fig. 1 shows the general arrangement, including the flat reflector between orchestra and audience which seems to have acoustical value.

The measures taken to produce good definition were largely similar to the presumed requirements for balance, for if free air paths existed between all listeners and all instruments, the right balance should then result or should lie with the conductor. The exceptional lowness of the platform was intended to help by giving a balanced view of the orchestra even to the nearest seat positions, and this seems to have been successful. Experience suggests, however, that slightly higher platforms should be acceptable acoustically.

Definition and clarity have been obtained by geometrical measures. The long reverberation desired for full tone is largely dependent on the absorption of surfaces, given, of course, that the volume of the hall plays a major part.

Initial computation showed that there was no risk of excessive reverberation except at low frequencies, because the audience and performers provide more than enough absorption at middle and high pitch for a hall of this volume. Therefore absorbents were limited to the minimum thought necessary to control echoes, except at low frequencies, for which extensive areas of panel absorption were provided on the walls. Absorbents to control echoes were used on the rear walls, the cornice regions, behind the boxes and on the splay walls to either side of the platform.

Experience at the test preceding the opening showed that reverberation would fall short of the intended figure in the lower and middle register, while the risk of echoes was less than expected. A number of absorbents were therefore removed. Slag wool was taken out of the air-space behind the wall panelling and from behind the leather-padded panelling of the rear wall and from the wall area behind the boxes, and some of these air-spaces were filled solidly. The wood-wool in the cornice region was plastered over except in one risky zone on either side. Slag wool was also removed from behind the slatted, so-called 'Copenhagen' absorbent in the splay walls near the platform. After all this the reverberation time has come out at 1.7 sec. at middle pitch, and musical criticism suggests that this is slightly below the 'ideal'.

The ceiling of the Hall may be contributing more absorption than expected. It is 2 in. thick plaster (a thin hard 'skin' and a softer backing) with a large air-space above (8-12 ft.), full of ducts covered with thermal insulation which can also absorb sound. Such constructions are not easily studied in the laboratory, but experience elsewhere has now suggested that they have appreciably more absorption than was previously supposed. It is a point to watch in future halls.

Another point is, of course, the simple fact that in a hall seating three or four thousand people, it is not particularly easy to get the volume large enough to ensure sufficient reverberation, considering the absorbing power of the audience. Additional volume is expensive, and the large indoor distances lead to the risk of echoes. To put

* R.I.B.A. Journal, January 1950.

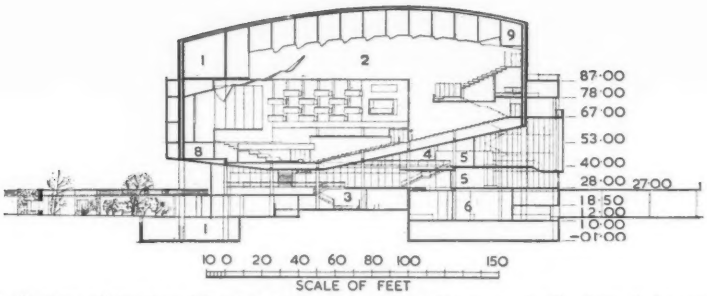


Fig. 1: Section of the Royal Festival Hall. Key: 1, Ventilation. 2, Auditorium. 3, Lower foyer. 4, Refreshments. 5, Restaurant. 6, Wash-up. 8, Practice room. 9, Projection

it bluntly, the problem is not to get reverberation short enough in a large hall, but to get it adequately long. This, incidentally, is a technical justification—if one is needed—for the device of a canopy over the orchestra. The ceiling at the source-end needs to be kept reasonably high or the view from the upper, distant seats begins to look like the entrance to a cave, and the height gives useful added volume; but it would cause echoes over the orchestra were it not for the canopy, which can be suspended in mid-air at the right height. The canopy itself serves the two purposes of helping the players to hear the orchestra as a whole (which is important for them) and of reflecting some sound towards the distant seats, which it does with almost too much success.

One word is desirable about the plan in relation to tone quality. The sides are parallel in general, rather than splayed like a fan as is sometimes the fashion today. The only reason for the choice of parallel sides at the time of the decision was the knowledge that it was a characteristic of many successful halls of the past, for it was thought that it might be a contribution in some way to their musical quality. Subsequently it has been found that several acoustical people had come separately to the conclusion that the fan plan tends to be troublesome for music. In the Festival Hall a fan shape has been given to the lower parts of the walls near the front to reduce the risk of cross-echoes, but the main elements of the plan are rectangular.

The insulation of the noise from the nearby railway bridge is virtually complete. The measures taken were: first, double walls and roof where the Hall projects above the surrounding foyers; second, the foyers themselves, which were given large areas of absorbent ceiling; and third, double doors and absorbent lobbies wherever the foyers themselves did not offer sufficient protection. The large inlet ducts for ventilation were treated with absorbents also. The whole is rather like a fortress in concept; certain parts are massive and impregnable, while the openings are defended by special measures.

Although the prime reason for high insulation was the railway, experience and noise measurements in other urban areas have shown that insulation of the same order will generally be desirable in all urban areas, because the low level of intruding noise contributes so greatly to clarity in the Hall. Remarks about this are made below in respect of the Colston Hall.

The noise of the underground trains which pass beneath the Royal Festival Hall can occasionally be detected during the quiet music. Effective insulation is exceedingly difficult and doubtful for this kind of noise.

For a musical appraisal of the Hall, the discussion on pp. 47-51 should be read, but it appears broadly to be a hall with a character of its own, likeable to the general public, and appreciative but exacting in respect of performance.

The Colston Hall. When the decision was first made to reconstruct the Colston Hall, it was initially proposed to retain the still standing balcony steelwork, although owing to its unsafe condition it would not be possible to employ it as a seating area. However, the space underneath was to have been used, together with the floor area in front of the balcony, to seat approximately 1,400 audience. It was later agreed that, in view of the poor acoustical conditions which would certainly obtain under the old balcony, this area should not be used for audience during concerts or plays, and further discussion yielded the happy decision to have the old balcony steelwork removed and thus release the whole of the shell of the building for the new hall which would be provided with a new balcony. The shape of the hall was still determined by the existing walls, and a limit was imposed on the height because it was considered inadvisable to extend these upwards.

Attention was at once directed to the need for adequate sound insulation, and to provide a basis for design the Building Research Station made a noise survey of the site. The results showed that the sound pressure levels due to accelerating traffic up the hills on either side of the site were high—practically as high as the levels measured at the site of the Royal Festival Hall. For this reason the architects were advised that care would be needed to avoid traffic noise being heard in the hall, and that a thick concrete roof would be the only construction which could be confidently specified completely to eliminate the noise. Practical difficulties precluded the use of such a structure, and the roof finally chosen was known to afford only sufficient insulation to avoid trouble from incoming noise. Experience in the completed hall shows that the insulation is very much what was envisaged. Generally there is no appreciable annoyance from incoming noise, but occasionally when a high peak of noise occurs this can be faintly heard in seats in the balcony near the ceiling.

The construction finally adopted consisted of a metal lath and plaster ceiling on which was placed about 1½ in. of vermiculite concrete. Openings were carefully protected so as to allow the ceiling to make a useful contribution to the insulation. The roof consisted of 3 in. wood wool slabs with asbestos cement sheeting which was bedded and sealed with mastic bitumen. Certain large ventilating ducts running to openings in the ceiling penetrated through the gable end of the roof before turning down into the ventilation plant room. In order to avoid any possibility of sound leaking through the walls of these ducts and so into the auditorium, these were constructed in hollow clay blocks, rendered and asphalted on the outside. To prevent drumming, the greater part of the ducts in the roof space were constructed in plaster board. Sound absorbent splitters were incorporated in both inlet and extract ducts to attenuate sound passing along these ducts both from the open air (traffic noise) and the noises caused by the ventilation fans.

When considering the acoustical design of the auditorium, account had to be taken of the uses to which it would be put. The architects obtained agreement to the proposal that the acoustical bias should be towards good musical quality because of the fine reputations for concert music held by the hall before its last disaster, although it was intended that the auditorium should also be used for other purposes such as boxing, dances and public meetings. At the same time it was decided that a maximum concert audience of 2,000 should be accommodated with a further 180 behind the orchestra when no choir was present, compared with 1,760 in the old hall.

The concert platform was rather restricted in area, owing to the need to keep within the old walls of the building. Moreover, since the floor of the hall had to be flat over a part of its area, it was necessary in order to obtain good sight lines to make the platform a high one, unlike the Festival Hall.

To ensure a good direct sound to the main seating area the rear part of the orchestral platform was formed in four risers of about 18 in. each. Provision was made behind the orchestra for a choir.

It was decided that although this was to be to a certain extent a multi-purpose hall, the design should be for a long reverberation time because the direct sound would be good enough, from the high stage overhead reflection, to make long reverberation quite safe. The volume of the new hall is about 450,000 cubic ft. and the Bagenal optimum for a hall of this size for orchestral music is 1·9 seconds; the value proposed by Knudsen is 1·6 seconds. A value of 1·8 seconds (at middle frequency, 500 c/s, with hall full) was finally chosen. It was decided that the

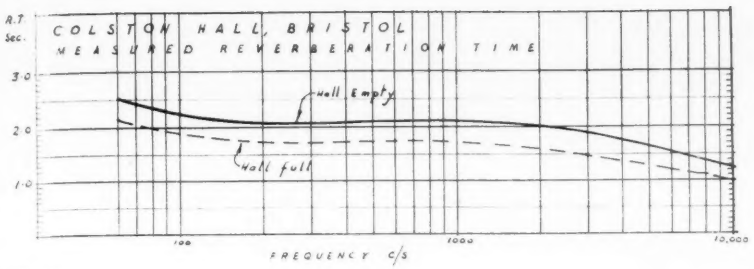


Fig. 2

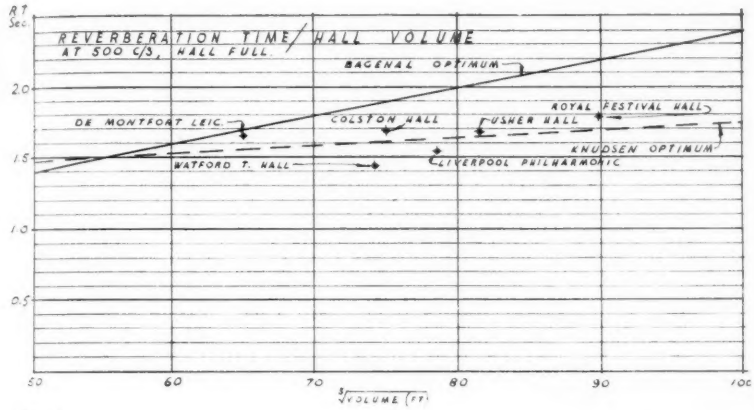


Fig. 3

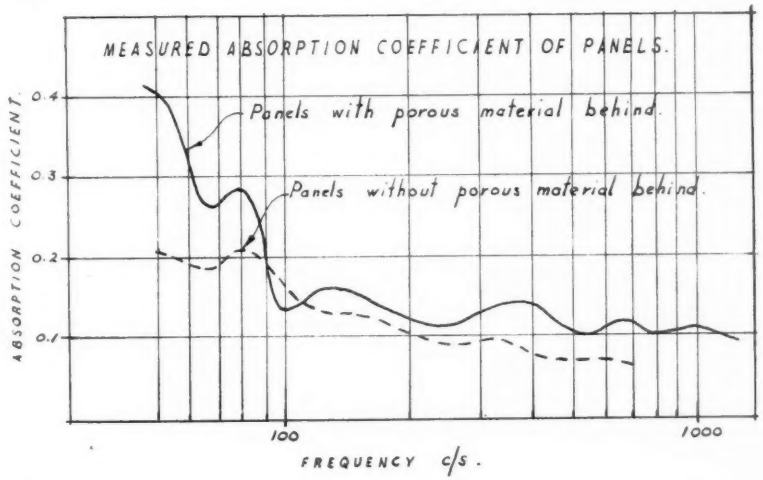


Fig. 4

reverberation time could be a little more in the low frequencies, but should be kept as nearly as possible constant above 500 cycles per second. The measured reverberation time curve, Fig. 2 shows that these aims were substantially achieved. For comparison the volume of the old hall was 500,000 cubic ft. and the calculated reverberation time with normal concert audience 2·1 seconds. Fig. 3 shows the middle frequency reverberation time plotted against hall volume for this and a number of other well-known halls.

Calculations showed that it would be necessary to provide substantial areas of low frequency sound absorbents and at the same time to limit the amount of high frequency absorbent, and to place the latter only in positions where there was danger of long-path returning sound (causing audible echoes) such as the rear wall. The walls beneath the balcony were, therefore, panelled (with chestnut veneered, and solid mansonia wood panels) with a fairly deeply modelled profile (to provide diffusion of the high frequency sounds). The panels enclose rock wool absorbent material, which in this position raises the absorption coefficient and widens the band over which the absorption is effective. In order to avoid the danger of long-path reflections in the side seats at the front of the hall, the first bay of panelling back from the orchestra was constructed of slats of wood, leaving spaces between so that the absorbent behind could operate on the middle and high frequencies. The soft material in these spaces was protected and visually masked by fine wire gauze.

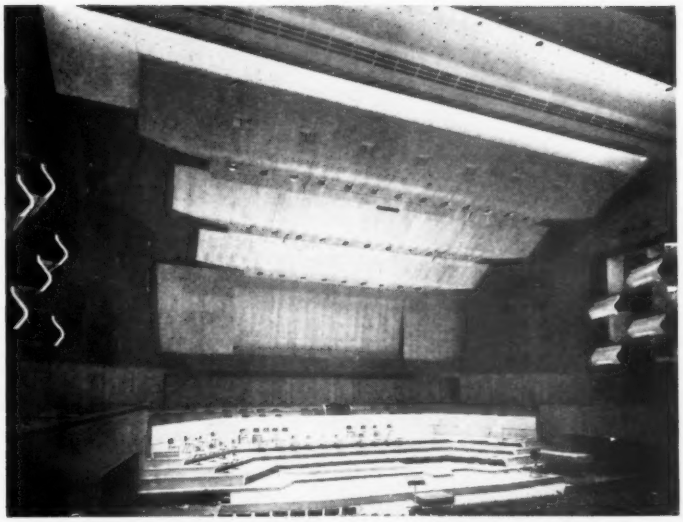
The side walls above the balcony were covered with large panels of Weyroc, a fabricated wood composition board $\frac{1}{2}$ in. thick. These were skewed in plan so as to form a sawtooth profile, with the object of providing wider band absorption and a better distribution of reflected sound in the hall. The cavity behind these panels was filled with rock wool absorbent, and a test sample of the treatment was measured in a reverberation chamber by the Building Research Station to ensure that adequate absorption would be obtained. The absorption coefficient curves are given in Fig. 4, from which the effect of the absorbent behind will be seen. Owing to the large average spacing of the panels from the wall (about 5 in.) the maximum absorption occurs at rather a low frequency. It was therefore arranged to decrease this spacing by reducing this cavity in some of the actual panels used, which would have the effect of shifting the whole of the curve up in frequency.

The only other areas of special sound-absorbent material were on the rear walls, where acoustic tiles mounted on $1\frac{1}{2}$-in. battens were employed, and in the coves between the side walls and ceiling where unplastered wood wool slabs were fitted. These areas were treated because they are potential sources of long delayed echoes.

During the construction of the hall, the Building Research Station made measurements of the reverberation time to ensure that the design figures were likely to be achieved, and when the hall was completed a test concert was arranged at which a specially augmented B.B.C. West Regional orchestra conducted by Mr. Frank Cantell played suitable test pieces. Groups of expert listeners moved to different seats during the concert and were afterwards asked to complete a questionnaire on their acoustical experiences. The results of analysing the answers showed that the treatment had been successful and that no subsequent tuning—for which provision had been made—would be necessary.

* * *

The permission of the Director of the Building Research Station to publish these notes is gratefully acknowledged.



The acoustic canopy of 2 in. thick laminated wood is suspended from the roof and houses the orchestra lights. There is a sound reflecting area of slate flooring in front of the platform

Photo lent by 'Wood

The terrace stalls from the main cross gangway. Carpets were limited to this gangway and the two side balconies to reduce absorbtion of sound. The bare flooring elsewhere has not been found to be noisy underfoot. The undersides of the seats are upholstered to make rehearsal conditions as far as possible similar to those with a full audience

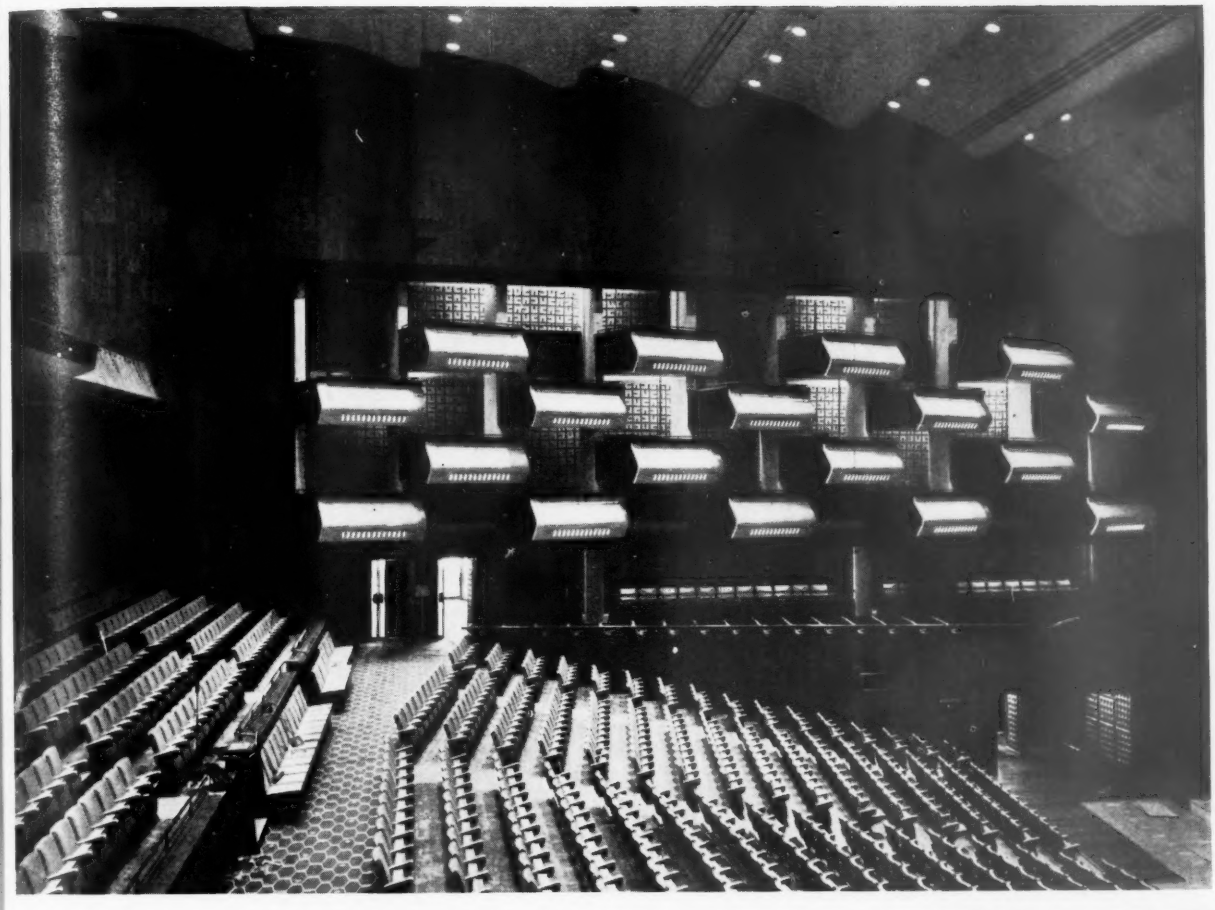
The projecting boxes help sound diffusion by being 'acoustically rough'. This view shows the ceremonial box. Below the side balconies the walls are surfaced with 'Copenhagen absorbent', which consists of wood strips with spaces between

The Royal Festival Hall, London

Architects: Robert H. Matthew [*A*], Architect to the London County Council. J. L. Martin, M.A., Ph.D. [*F*], Deputy Architect. Edwin Williams, M.B.E., M.A., B.Arch. [*F*]. Stanley S. Smith, [*A*], and Peter M. Moro, Dip.Arch. [*F*]

THE PLANS OF THE Royal Festival Hall were published in the August 1949 issue of the JOURNAL. A technical description will be published in the forthcoming April JOURNAL in the form of a report of the paper entitled *Some Scientific Aspects of the Design of the Royal Festival Hall* to be delivered by Dr. J. L. Martin at the R.I.B.A. on 18 March.

A general view of the Hall from the top of the balcony. Note the low platform raked upwards in regular risers with choir seating behind.



The walls are lined with large areas of elm panelling. The spaces behind were originally filled with slag wool, but this was removed after the test concerts. The wall behind the boxes has also been made less absorbent than was intended and is now of cloth on concrete

The front face of the balcony is sloped backwards to prevent direct reflection of sound back to the platform. The ceiling has large numbers of plugged holes for tuned absorbers to get rid of single resonances as occurred in the Copenhagen broadcasting hall

The Colston Hall, Bristol

Architect: J. Nelson Meredith [*F*], City Architect

General view of the interior of the rebuilt hall. Side galleries were introduced to give an intimate atmosphere and to accommodate the required number of seats without an excessive overhang of the balcony. The new interior has been built inside the masonry shell of the old hall, which survived the fire

THE COLSTON HALL has played an important part in Bristol life since 1867. Always a multi-purpose hall, it has contained many hundreds of packed audiences to hear world-famous speakers and musicians, to cheer or boo at boxing contests, to be entranced by ballet dancers (such as Pavlova), or even to watch dog shows; mainly it has served as a centre for choral music. Twice gutted by fire, it has now been rebuilt once more as a multi-purpose hall, though this time with a stronger emphasis on its use for music. In this, full advantage has been taken of the research work in acoustics that has taken place during the last 30 years or so and the Building Research Station have acted as acoustic consultants. A detailed description of the acoustical properties of the hall and of the methods used to obtain them will be found in the description by H. R. Humphreys [*A*] on page 40.

The new hall has been fitted within the massive walls and above the old bonded warehouse left after the last fire. Fortunately the shape of the old hall permitted the rectangular form now considered desirable for concert halls, though in many respects the contrary has been the case, the acoustical requirements rather than the old shell determining the hall shape.

The seating capacity is 2,000, with an additional 182 in the choir seating. To avoid the undesirable overhang to the balcony which so large a number of seats would have required, side balconies have been introduced; this helps to give a pleasantly intimate atmosphere. The front of the auditorium floor is level and has a polished strip hardwood flooring (West African muhuhu) for dancing and exhibitions. The seating can be lowered to a store below. A section of the stepped portion can also be slid on rollers beneath the rear steppings to extend the flat floor when necessary. A removable boxing ring has been specially designed and flood lighting provided for it.

The large areas of chestnut panelling, rising to a height of 50 ft. around the concert platform, are designed to give the required resonance. Similar panelling under the side balconies is in a series of convex shapes for good diffusion of sound. The facing of this is chestnut veneer, relieved with 4 in. wide strips of mansonia. This panelling is removable to enable adjustments to be made to the acoustic properties if desired. Above the balcony level the walls are lined with saw-toothed 'Weyroc' panels with polished hardwood edges (red merenti). The concert platform is of European oak strip and the canopy over it is of plaster, partly fibrous and partly in-situ. This is designed to reflect sound over the auditorium and to return a portion to the orchestra.

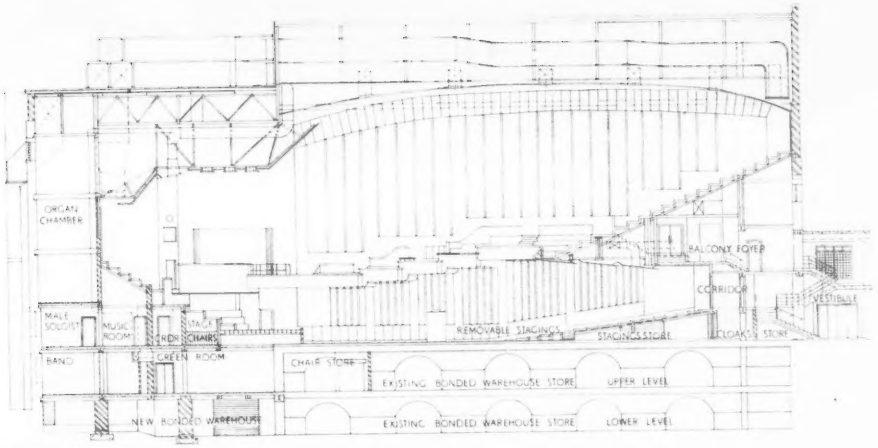
The organ chamber at the back of the platform is faced with a grille with vertical members of aerofoil section in mansonia; the main divisions are painted in gold. The organ, which is being built by Harrison and Harrison of Durham, will be completed in 1954. A sound-proof room with a window overlooking the platform has been provided for broadcasting; a similar room opposite is for electricians and control of amplifiers.

The constructional job was difficult owing to the awkward access to the site and to the large amount of debris, of which nearly 3,000 cu. yd. was carried away. Nevertheless demolition began on 26 April 1950 and the first acoustic test concert was held on 5 June 1951—a total construction time of 58 weeks. A little of the old steelwork was adapted for use, but most of it was new. The balcony construction required a single plate girder 69 ft. long and weighing 15 tons 10 cwts., brought in on a Sunday in one piece, and a lattice girder of the same span and weighing 14 tons 15 cwt. The roof framing consists of seven principal steel trusses of 82 ft. 3 in. span, spaced at 14 ft. 10 in. centres, each weighing 4½ tons, one gable truss, and a main lattice girder of 66 ft. span to the flat roof at the north end. The truss shoes rest on steel spreader beams with double copper sliding joints. The outer roof surface is of 22½ degrees pitch and covered with dark brown asbestos sheeting laid on 3 in. wood-wool slabs. To exclude external noise the existing windows were blocked up with double 9 in. walls and the whole of the auditorium ceiling covered with 1½ in. of vermiculite concrete; the corridors round the hall also act as sound buffers.

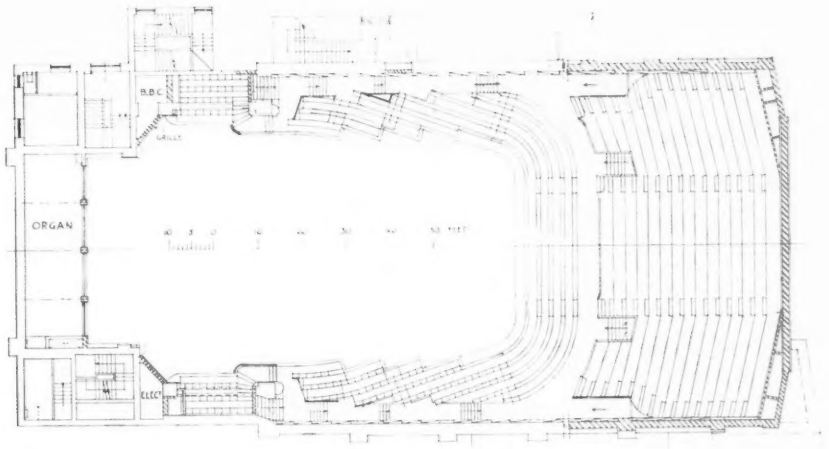
The double plenum ventilation system takes in fresh air at high level through a battery of filters to the fan and heater on the flat roof. This heater is of gilled copper tube. Air enters the auditorium through vents in the main ceiling, in the soffit of the balcony and in the canopy over the platform. The system also serves the green room. Extraction is through grilles in the steppings of the balcony and mushroom vents in the auditorium steps. There is a fan for recirculation. The total input capacity is 50,000 cu. ft. a minute and extract is 45,000 cu. ft. Heat is supplied from two automatic stoker boilers in the basement. Radiators and vectair heaters are provided in corridors and other rooms.

Items of miscellaneous equipment are: auditorium lighting on dimmer control operated in the electrician's box; secondary lighting; 46 automatic fire detectors with direct connection to Fire Brigade headquarters; fire mains to hydrants and hose reels plus hand fire appliances; a system of house telephones.

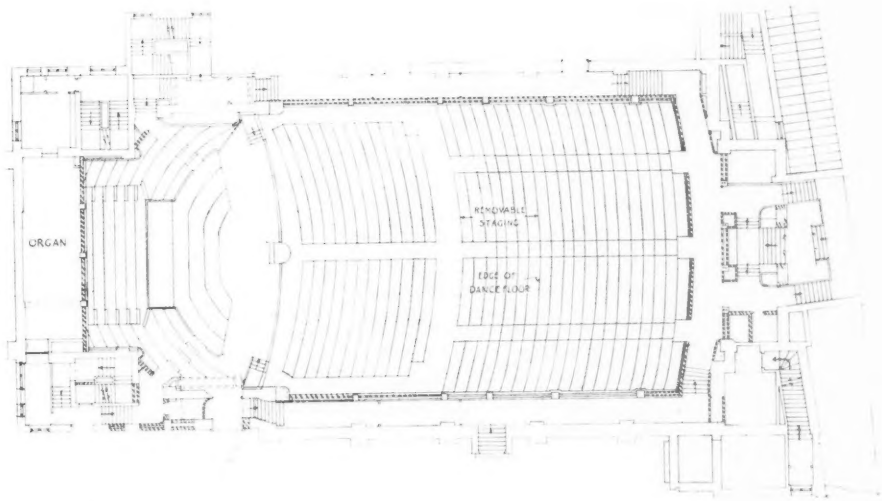
The senior architectural assistant in charge was Mr. T. S. Singer, A.M.T.P.I. [*A*]. Assistant architects: Mr. S. G. Howitt [*L*] and Mr. W. F. Holland [*A*]. Consulting engineers for heating and electrical work: Messrs. Hoare Lee and Partners. Quantity Surveyors: Messrs. Bernard and Son (Mr. A. G. Taplin, F.R.I.C.S.). Organ consultants: Dr. H. K. Andrews, New College, Oxford, and Dr. W. K. Stanton, Bristol University. General contractors: William Cowlin and Son, Ltd. Clerk of Works: Mr. E. W. Giddings, M.I.C.W.



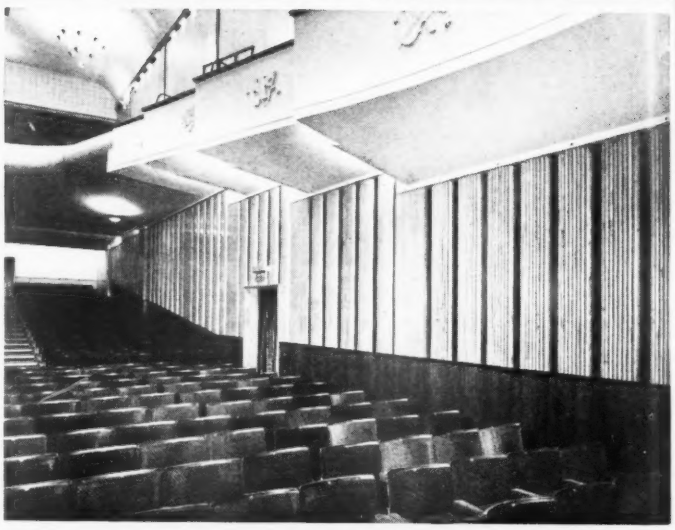
Longitudinal section



Plan of balcony



Plan of main floor



The Colston Hall, Bristol. Views of the interior. Above: the platform is surrounded with large areas of chestnut panelling to give the required resonance. Top right: the canopy over the platform is of plaster, partly fibrous and partly in-situ. The inspection windows to control rooms overlooking the hall for the use of electricians and broadcasting controller can be seen on either side of the platform. Middle, right: the walls under the side balconies have convex-shaped panelling to diffuse sound and are veneered with chestnut. Bottom, right: a view showing the flat front portion of the floor. Below: the first five rows of stepping at the back of the hall can be removed to extend the flat dance floor

Musical Quality in Concert Halls

A Discussion Based on the Royal Festival Hall

At a meeting of the Acoustics Group of the Physical Society, held at the R.I.B.A. on 23 November 1951. Mr. W. West in the Chair

A MEETING OF THE Acoustics Group of the Physical Society was held at the Royal Institute on 23 November to discuss the acoustics of the Royal Festival Hall from the musical point of view. The discussion showed very clearly the qualities required in the design of concert halls generally and it was thought desirable therefore to report it here in conjunction with the descriptions of the Colston and Royal Festival Halls. The Chairman was Mr. W. West. The discussion was opened by Mr. P. H. Parkin and concluded by Mr. W. A. Allen, both of the Building Research Station. Parts of Mr. Parkin's remarks which are covered by the description of the Hall on p. 39 are omitted here.

Terminology is a problem in the discussion; the same words are used with different meanings by musicians and scientists. To assist reading, changes have been made in the remarks where the technical meaning of the speakers was clear. The problem arises particularly with the words 'echo', 'resonance', and 'reverberation'. It is hoped the changes have not led to error.—*Editor.*

Mr. Parkin: Our chief purpose this evening is to consider the musical qualities of the Festival Hall and learn any lessons it has to teach for the future.

Apart from the test concerts before the opening, there have been two occasions which might be described as 'tests' and gave interesting results. The first was in June when Mr. Stokowski conducted a concert in which the chief item was the Stravinsky 'Rite of Spring'. After discussion with us he suggested arranging the orchestra with all strings to the left.* Seven music critics sent us their views and were favourably impressed. Typical remarks were: 'An ideal balance between blend and definition'; 'I have never heard the strings of the B.B.C. Orchestra produce so warm and rich a tone'; and 'I enjoyed the richness of the string tone more than any heard previously'. These views might be borne in mind in considering some of the criticism of string tone from conventional orchestra arrangements in the Hall.

The second occasion was in September when 18 foreign scientists doing acoustic research were allowed to listen in several critical positions in the Hall. Professor Bolt of the U.S.A. said '. . . it was extraordinarily good'; Professor Canac of Marseilles, 'the Hall is superior to all halls I know'; and Professor Meyer of Germany said '. . . the best, or near the best'. It is worth noting that three of these scientists who were connected with broadcasting had less favourable remarks; thus Professor Furrer of Switzerland said the Hall was too big ever to be satisfactory for loudness.

Coming now to the general comments in the press, I hope we have heard the last of mistakes in playing being blamed on the acoustics. Also, I think it is a little hard on us when musicians say scientists are unmusical and have produced in the Royal Festival Hall exactly what is pleasing to scientists. There was only one scientist concerned with the Festival Hall, and that was myself, and I am really an engineer. Also, it assumes that scientists *can* produce exactly what they want: I only wish this were true. In the second place musicians have been consulted about the acoustics of the Festival Hall, for the first time in history so far as I know, and certainly on a much bigger scale than ever before.

The most common terms used in the press to describe the acoustics have been 'brilliance' and 'clarity'. Some other adjectives have been: touchy, glorious, hard, alive, dead, cold, warm, rich, shrill, intimate, merciless, matt, dry, and (my own favourite) Chaucerian.

The requirements we originally determined for the Hall were definition, full tone, blending, balance, a low level of intruding noise, and of course no echoes.

I want very briefly to discuss these comments in terms of our original requirements. I think there is little doubt that we have obtained three—definition, a low level of intruding noise, and no echoes. The fourth requirement was balance, and in the platform design we have attempted to give all instruments as equal a chance as possible, and I think the responsibility must rest with the conductor now. As to blending, this is a mysterious quality in acoustics, and one which does not appear to depend entirely on the Hall. In the Usher Hall recently, at the last Edinburgh Festival, the New York Philharmonic Orchestra was criticised for the tone not blending. Three or four days later another orchestra, the B.B.C. Orchestra, was praised for its blended tone.

The main criticisms have been concerned with fullness of tone, and there have been complaints that in romantic and impressionistic music the Hall does not fill with sound as it should do. We shall be very much interested to hear what is said in the discussion on this quality this evening. I think before people give their comments we must remember that we have a large hall here, and at the same time orchestras have decreased in size compared with pre-war. In the Queen's Hall, two-thirds the size of the Festival Hall, the full B.B.C. Orchestra, I think, used to number almost 120, whereas the average size nowadays appears to be between 80 and 90. In the Stokowski concert we had an orchestra of 118, and I do not think anyone could have complained on that occasion of any lack of tone. It is true that the smaller orchestras do fill much larger halls, but this is at the expense of another requirement which I have not yet mentioned—reasonable acoustic uniformity over the whole audience area. One of the most stunning performances I have ever heard was Sir Thomas Beecham conducting the Overture '1812' in the Empress Hall, but for that I was seated close to the orchestra. I moved to another seat for the Beethoven Sixth Symphony, and for most of the orchestral sound it was impossible to distinguish even the melody being played, except for the trumpets, which stood out clearly. In the Festival Hall I am sure we could have all the fullness required, even with a small orchestra if, for example, we were to sacrifice the few hundred people who sit at the back of the terrace stalls.

Mr. Geoffrey Sharp (THE MUSIC REVIEW): The clarity in the Hall is such that the slightest inaccuracies in performance stand out from the rest of the texture, as, in my opinion, they ought to stand out. A hall which emphasises details of this kind will perform a great service in discouraging slovenly orchestral playing, and it may also discourage what I call 'cloth-eared listening'.

I have, however, sat under the grand tier twice; and the definition there is to my mind poor, as if a thick blanket were suspended from the front of the grand tier. In the new Free Trade Hall in Manchester the blanket, it seemed to me, is even thicker.

Perhaps my most serious criticism concerns the texture of orchestral tone in the Festival Hall. There is something missing; there seems to be a hole in the middle of the texture. Where, for example, one wants to hear massed violas, one does not hear them in the Festival Hall unless they are playing by themselves. It is the same with some of the lower wood-wind notes and lower flute notes. They are notoriously weak, but still they ought not to get entirely lost. Middle clarinet texture often goes completely. Again, exactly the same effect is noticeable in the new Free Trade Hall, Manchester.

After listening to rehearsals and concerts in the Free Trade Hall, it is clear to me that orchestral sound in the empty Hall is much brighter and preferable to the sound with an audience present. I have never heard an orchestra in the Festival Hall when the Hall was empty, so I have no means of knowing whether the same thing applies.

* See cover picture of this Journal.

Mr. Hope Bagenal, D.C.M. [*F*] (senior consultant for the Hall): It is a little difficult to speak on this subject: it is so much canvassed, and it is so interesting, and we all have our views about it. We all ought to have our views about it, and I think everyone who has clear views about it such as we have just heard ought to express them; but if they are not there, I think we ought to wait over a number of months or even years. The longer I study this question and others in the same field, I am sure this question of consent is really at the bottom the most difficult thing of all.

I too feel a certain gap, but that is subjective, and if you look for that gap on objective measurements I do not know that you can find it. I should be interested to know whether our physicists can comment on that.

On the question of relative definition or fullness, I would like to give one illustration which I think will help us in this difficult question of blending. There was a very good criticism of the Hall some weeks ago by a critic who said that the later romantic composers like Wagner, Strauss, and so on, could not get their atmospheric effect, that their music was solid; and he then went on to the surprising difference when Wagner is heard, for instance, in the Prinzregent Theater in Munich. The Prinzregent Theater is a Wagner theatre, and a Wagner theatre is the opposite of the Royal Festival Hall. The Wagner theatre has an enormous pit going right down under the stage in which are 109 instruments, all blended in that pit, and let out through a sort of great floor crack upwards into a hall with considerable reverberation. How the conductor in the pit of the Wagner theatre can hear what the sound is like outside I never discovered, but at any rate there is a remoteness and a unity about the Wagner theatre tone which is quite marvellous for Wagner, and you do not know what Wagner is like until you hear it under those conditions; the whole gigantic orchestra blended and subdued, and the singers being able to make themselves heard. That is the extreme case of blending, but when I was in Munich the manager of the Prinzregent Theater said this theatre was quite hopeless for repertory. He said you could not do Mozart in a Wagner theatre, the reverberation is too long.

On the one hand we have an extreme of blending, and in the Royal Festival Hall an extreme of definition. Can we, in future designing, strike the right medium? I tend to agree with criticisms coming from B.B.C. quarters that too much reflecting of sound causes too much definition, and that we could do with very much less. The only point is that this would apply more to halls of moderate size and to studios than to the big hall. We have just heard how, under galleries, the tone changes, and there appears to be a blanket. It is in order to try and overcome this that we use reflecting surfaces to penetrate under projecting galleries. If we want the type of hall with a much longer reverberation, with big, rectangular, cubicular shapes instead of space, with more inter-reflection and therefore with longer reverberation—and such a hall, in my opinion, would be most desirable in London for choral music, for the B minor Mass, and for the more atmospheric types of romantic music and modern music—we should not then be able to go at these very rapid tempi that are now so much desired.

I think we ought to keep in mind that there are two different sets of requirements, the classical on the one hand, with definition, and on the other hand the whole other category of music needing to go slower, and needing choral tones, fullness of tone.

Sir Adrian Boult (written): After about 20 concerts in the Hall I think I may say that we in the London Philharmonic Orchestra are getting to like it very much indeed. It certainly frightened us at first with its faithfulness, but, as I have said on a number of occasions, the halls that will translate an unpleasant sound uttered by a performer into a beautiful sound when it reaches the audience are few, and one of these, the Leipzig Gewandhaus, is, alas, no more! The Festival Hall certainly demands a very high technical capacity. Lengthening the reverberation slightly would be a good thing, because it is almost too faithful in the way the end of a note is sharply cut off. I believe, too, that lowering the canopy a little would help. It is not easy for those on one side of the platform to hear what is happening on the other. But, as I say, it is already one of the great halls of Europe, and I know that foreigners are enjoying it very much.

Sir Malcolm Sargent (written): My general impression of the acoustics is that they are *excellent*: quite the best I have found in the world for any building of comparable size.

I regret the cement floor which has made the upper platform almost unusable for double basses. This should be converted to a hollow resonating cavity. If the timps. are too resonant over the hollow, they could be placed on a 'sorbo' mat. I also regret the slate bed in front of the violins. I feel this is tending to an exaggeration of upper partials, causing a shrill quality. I believe a polished wooden surface would be better.

I feel the reflector over the orchestra should be lower, and hope that the organ console will not be permanently in the middle of the choir, taking up valuable space, and dividing the singers. The best place for it would be on the floor level near the conductor's entrance on the opposite side, so that the organist sees the beat over the console facing the conductor; the console being on a long cable so that for recitals it could be moved to the centre of the platform.

Acoustically, we need slightly more middle and bass. In my opinion, the exacting character of the acoustics is having a good effect on the quality of performance.

These are criticisms, but on the whole I must stress that I am filled with admiration and satisfaction.

Mr. Harry Blech: There is very little I can add to the remarks of Sir Adrian Boult and Sir Malcolm Sargent, but there is the question of echo. The impression I have is that we are all so worried about the Albert Hall and the Earls Court Stadium that we have done everything possible to prevent such an experience being ours again. But there are other things to be thought of than that. Echo is a very bad thing. In the Royal Festival Hall there is none, and I am told that in a hall of over 3,000 people that is an achievement; but there is a tremendous difference between echo and resonance. Musicians, especially singers and violinists, depend for their acceleration and performance on resonance, and this is a thing which I find lacking in the Royal Festival Hall.

It is very difficult to define resonance; it is something every singer wants to get; if he feels there is none he is miserable. Every violinist or string player needs a certain amount. Perhaps it is merely a matter of reverberation. It is important to find out because on resonance hangs, I should imagine, that magic bloom which some halls produce in voice and violin, and others do not.

That leads to the question of the difficulty of hearing the inner parts. I do not want to hear violas and second clarinets sticking out, but one should, if one is a musician, be able to say what those instruments are playing, and I have often found it quite impossible to tell they were playing at all. I could see they were playing, but I could not hear anything. Mr. Sharp was perfectly right when he said the inside parts were not clear enough. I think the reason is closely connected with resonance. It is very like when I turn my wireless set up to take higher frequencies and all mellowness goes, all body goes, and you get a rather shrill noise in the upper strings. I am told by the experts that that is a very desirable quality, because all the latest American records sound like that to me.

The only other thing I have to say is about blend. I used to notice in a string quartet, the poorer the instruments were, the worse the blend became. If you heard a French quartet playing on rather poor French instruments, you would hear every part clearly, but no blend. The moment one got a fine Stradivarius or other fine Italian instrument, the whole blend seemed enriched. Could we find out what that quality is, if it is not resonance? I think it is just a finer form of resonance. If we could find out what that quality is, and utilise that knowledge in the Royal Festival Hall, we could make it really perfect.

The Chairman: We have a ghost present. Mr. Leopold Stokowski, when he was here in June, took much interest in the Festival Hall, and his impression has been recorded.

Mr. Leopold Stokowski (recorded). After hearing several concerts by other conductors in the new Hall, and making one rehearsal myself, my impression is that generally speaking this is the . . . finest hall that I know of anywhere in the world. In my opinion, it can be made even better by two adjustments; one, to increase the reverberation period over the whole tonal spectrum; the other, to do everything possible to increase the reflection of the middle

and low tones. As everyone knows, the modern orchestra is extremely brilliant in the upper tones, fairly full in the middle tones, but weak in the low tones. That is so all over the world . . . therefore, anything we can do to strengthen them will help us establish a good balance by compensating what is weak. . . . But generally speaking I am most enthusiastic about this Hall.

Mr. Ritson Smith (Royal Philharmonic Orchestra): I was asked if I could get in touch with Sir Thomas Beecham about this contribution rather too late, because he was away from town. He expressed himself however as very pleased with his first rehearsal, and of his first concert there, he said: 'I can not listen in the auditorium, but I can hear all I want to'.

I did not know Mr. Harry Blech was going to be here. I hope he will not be too embarrassed if I say I attended his concert in the Royal Festival Hall, and enjoyed that more than anything I have heard there. It leads me to make the point that the smaller the number of singers and players, the better it seems to sound.

The Oriana Madrigal Society sang at one of our concerts last week and I listened in every part of the Hall. There is a weakness under the grand tier; it is not quite clear there; but elsewhere it was really extraordinarily good in each case. Mr. Heifetz, when he was here, told me he considered it, from an artist's point of view, the finest hall in the world, and I suppose he has been in as many halls as most people. Several soloists and a group of singers at the Royal Festival Hall yesterday all agreed they found it extraordinarily easy and comfortable to sing in.

Mr. Parkin has made a reference to echo from trumpets. We had the King's Trumpeters there last night, and this criticism has been pointed out to me today by half-a-dozen people. They were sitting in Row H of the stalls, on the left-hand side as you look from the platform. They thought they heard an echo when these trumpets played right over to the boxes.

The Royal Philharmonic Society have been in the Hall, and they have decided to go there again for next season, so you can take that for what it is worth.

Mr. Thomas Russell (Chairman of the London Philharmonic): I must cross swords with Mr. Bagenal. Although the Prinzregent Theater is an extreme case of the Wagner theatre, I think he is posing the problem unfairly in suggesting we have no alternative to the other extreme of definition. If it is so, we are in rather an unfortunate case, because I myself believe every musician here has made some moderate complaint about the definition in the new hall. The complaint is modified by the fact that it is very delightful for musicians to play in a hall where everything they do is faithfully reflected, and the members of our orchestra are more happy in this hall than in any other in this country.

For the listener there is something still to be desired. A certain amount of that 'something' is to be heard in the Free Trade Hall, Manchester, where I was last Saturday evening. It is not to be heard faithfully in every part of the hall, but in the circle one had the warmth from the added reverberation, which added a thrill to the general performance which is almost consistently lacking in the Royal Festival Hall. Piano tone in the Royal Festival Hall is much more brittle than it should be. If one hears Dame Myra Hess play the same concerto with the same orchestra in the Albert Hall and in the Royal Festival Hall, one feels this point. The lack of reverberation gives less quality to the tone. In the orchestra it affects particularly the wind players, who normally rely on the reverberation period to cover up essential gaps when taking breath. In the Royal Festival Hall one can almost hear them breathe.

There is one other point. I and a number of others who have been going to the Hall are saying it has already improved. That may be because the seats have been sat on by thousands of people and the texture may be harder; or we may be getting used to the Hall, and clearing our ears of the Royal Albert Hall. We are becoming accustomed to it, and enjoying it more. Certainly one feels the dryness is becoming humanised.

I must express one regret about the Royal Festival Hall which I did not feel fully until I went to Manchester last week, where there is a similar canopy to that in the Royal Festival Hall. That seems to me the expert's admission of defeat, to build a very beautiful hall, and disfigure it with a canopy. I should have thought by this time the problems could have been solved in the architecture of the Hall itself.

Mr. John Cruft (London Symphony Orchestra): I agree with Mr. Russell's view that the Hall seems to have improved. Musicians are a superstitious lot, and they think you can play an instrument in, and play a hall in, too.

There is the practical side of this; in the early days of the Festival, the Hall was so busy with concerts that no orchestra had enough time to rehearse there. They came, were frightened by its clinical appearance, sat down, and heard all sorts of things they had not heard before at the Royal Albert Hall, where most of them had done a lot of playing. You do not hear much there except what you are doing yourself. They realised other people were hearing them and they had not thought of being heard before, and everyone became highly strung and objective, and critics pointed out that the slightest error could be spotted. In practice the players got nervous, they rushed in and did one rapid rehearsal and rushed out, and passed another orchestra on the stairs, so to speak, and then came and did their concert. Now things are less hectic; it is possible to get more rehearsal, and players are getting at home there, though they still feel it is a bit like dentistry. Their subjective feeling is having an effect on the sound. You can not play resonantly —I am a wind instrument player but I am sure the strings would agree—unless you are feeling in the mood, and the same may apply to orchestras. They are now feeling it is possible to make music there.

Having said all that on behalf of the Hall, I do agree with the other speakers that we would like it to help us a little more. We do feel still the Hall is not wholly on our side.

I met Mr. Russell at Manchester on Saturday, and I too had the impression the Free Trade Hall gives a warmth of response which we still do not get from the Royal Festival Hall. It has a lot to do with balance. Perhaps if we were given a sudden influx of extra resonance, and allowed to take a step or two backwards, that might get us over this difficulty.

Dr. Greenhouse Allt (Principal, Trinity College of Music): My opinion is only that of a listener. I have not conducted in the Hall, as I have mostly conducted in the Usher Hall, Edinburgh. Most of what has been said about the Royal Festival Hall was said about the Usher Hall—holes in the orchestra, we do not hear the violas and low notes and wind in certain places in the Hall. In my opinion, the Festival Hall is a magnificent hall. One point that has not been put is: the Hall has done something for music that no other hall in the country or in the world has done. It has taught careful listening. People are listening in the most extraordinary way to music in that hall: they do not wholly listen in the same way in the Albert Hall or in any of the other halls. That has been a fine thing from the point of view of a musician.

What Mr. Ritson Smith has said has been my experience. I listened to that particular choir, I listened to the orchestra last night and the trumpeters. There was a blast from either side last night, and I thoroughly enjoyed it. The work ('Belshazzar's Feast') is a barbaric work: I have conducted it myself many times, and I love it. That marvellous mass of sound came from either side. I did not hear the reverberation or echo that somebody heard, but I got a thrill.

We speak about the violas, but they did not come through last night. I remember Sir Henry Wood said 'Turn your f's as much as you can to the audience'. It may be quite wrong, but Sir Henry Wood insisted that more sound came that way. Last night the violas did not come through.

I am certain we should all be most grateful to the physicists for taking the trouble to come into the world of music and give us something to argue about. Many of us let music flow over us; it is a rush of sound; it should be something more than that.

When Beecham played a fortnight ago with the Philharmonic he got that lovely sheen in the Delius in the strings that so few people seem able to get. I suggest the whole problem is a problem for musicians such as the ones you mention to get down to training their orchestral balance to fit the Hall. The weak notes of the flute want dealing with carefully, and there is a weakness in the bass.

Mr. Bean (Manager, Royal Festival Hall): It might interest you to know that when Sir Thomas Beecham was in the Hall I caught him in the Green Room, and asked him to express his views frankly on the quality from a conductor's point of view—to put down his notes. They rather bear

out what other speakers have said. In the string passages he avoided the dotted notes when played loudly because they tended to sound screamy and sharp. In the soft passages, he thought they were perfect. He said the note was shorter in the Hall than it probably should be, but only just a little shorter, and it would only be very noticeable to the careful ear in passages in the brass and when the violins were in the high register. He doubted very much whether one person in a thousand in the audience would be aware of it, and so far as the conductor was concerned, it was a problem which could be dealt with quite easily.

Miss Joan Hammond (written): I have only given a recital in the Hall, but I found the acoustics excellent. The only observation I made at the time was a feeling of singing against a wall because of the unusual platform height with no audience below, but all rising steeply above. It has the effect of making me want to raise my head higher than usual. Upon realising the excellence of the acoustics . . . I became accustomed to it and enjoyed performing in the Hall.

Mr. Denis Matthews (written): I enjoy both playing and listening in the Hall. I feel strongly that some of the adverse criticism by musicians is unfair because (*a*) London ears have had 10 solid years of the Albert Hall, and (*b*) complaints about balance and "blend" should be blamed on performances rather than on the Hall. I would prefer just a little more resonance.

Mr. Desmond Shawe-Taylor (written): I first heard music in the Festival Hall at the second test. I thought then that the tone was too dry, and voted in favour of more fullness as opposed to definition. I do not know if modifications were subsequently made, but in the course of concert-going I have come to feel that the fullness of tone is now enough to be satisfactory in 18th- or early 19th-century music, i.e., a Mozart piano concerto, and most of Beethoven. It is when I hear in the Hall late 19th-century romantic music, such as Wagner, Strauss, or Tchaikovsky, that I feel a deficiency: the music does not seem to blend into the rich and sumptuous effect which the composers intended. I should guess that reverberation is still a little too short.

I also wonder whether placing the violins in the trough of the valley is a good idea when I sit roughly on the level of the brass and percussion: I feel that what they have to say is coming straight at me, while the violins struggle to be heard. In the Bayreuth Festspielhaus, Wagner sounds incomparably beautiful; brass and percussion are right at the back, sunk furthest beneath the stage, their sounds 'cushioned' by strong and glowing string tone. Of course, I realise it is a theatre, not a concert room; nevertheless, we must find some way of preventing the tutti in large modern scores from sounding raucous. They do not sound raucous, for instance, when the Concertgebouw Orchestra plays in its own hall; but the majority of large climaxes for any orchestra seem to me somewhat coarse and hard in the Festival Hall.

Mr. Harold Rutland (B.B.C.): I am giving my personal views only. When I first went into the Royal Festival Hall I was at once struck by the thought that an orchestra playing there would have to be on its mettle. We have been told it is good for orchestral players: yes, but what is a hall for? Is it to be, as it were, a lesson to orchestral players, or designed for the enjoyment of the public? Then we have been told, too, that the Hall is admirable for 18th-century music. This has been said again and again. But surely the Royal Festival Hall, in more or less the centre of London, is designed to be the main concert hall in this capital city, and the orchestral repertory largely consists of late 19th-century music. I think we most of us agree that such music is not heard to advantage in the Royal Festival Hall.

I agree with Mr. Russell about the canopy. I can not understand how a hall which was designed to be a hall for music as an entity should give the appearance of having this sound canopy reflector suspended from the roof almost just as it is in the Albert Hall, where we know it was put in to help matters; but there it is, an excrescence in the Royal Festival Hall.

I feel the sound is clear: we all know that. There is no echo, but it is hard, bright, and dry, and I do hope all the bouquets handed to the planners of the Hall and the experts tonight and in future will not prevent something being done to make it better. After all, nearly everyone who has praised the Hall has added certain qualifications, and has had certain doubts, and I do think something should be done. We are able to hear, with reservations, the strands of the texture, but music is more than that; and I do not think you get that something more in the Festival Hall. It is wanting in warmth and richness of tone.

I was told the preliminary Committee recommended the reverberation period to be two-and-a-quarter seconds. I know this is a difficult matter to talk about, there are all kinds of things that come into it. I am told now that the general reverberation period is something like three-quarters of a second. I should have thought two-and-a-quarter seconds was too long; something like one-and-a-half seconds might be a good thing to aim at; three-quarters of a second I thought definitely too short.

It is a wonderful hall, and it just needs that little more.

Mr. Frank Howes (THE TIMES): All I have said about the Hall has been published. The bulk of the criticism made this evening about the Royal Festival Hall has pointed to a lack of resonance, and that is a point with which I concur. It is very difficult to get fully saturated sound there. This was apparent last night and in any Wagner concert when you want to fill the place with sound so that it makes the walls bulge. The walls of the Festival Hall just mop it up.

At one time I dabbled a little in the psychology of hearing. One of the qualities of sound that was detailed in the book I read on this was the quality of extensity, as contrasted with intensity. I was never absolutely certain I understood it right, but the view I took then was this capacity I am trying to indicate. You know what an intense sound is: it bears in till you can not bear it. I take it that extensity of sound is the ability to flood a building until the roof goes up or the walls bulge. The music in the Festival Hall does not do that.

Sir Adrian Boult put his finger on one of the symptoms: the music has gone before you have taken the bow off the string I remember the first chord in E flat, staccato, in the Coriolan Overture. It had got to Battersea before the orchestra stopped playing—gone right away, to the south coast.

It is for the experts and architects to say how you are to get more resonance. We laymen find it a little difficult to choose our language when pinned down. When they ask, 'By resonance do you mean reverberation?' I say 'Oh . . .'

However it is done, we can say to the architect that we have all had an ear bath, we all take enormous pleasure in the Hall, we all hear what we never heard before. I demur a little from the suggestion that there are too many holes in it: my own experience and that of most of the people I have talked to has been to the contrary; we have heard the inner texture of even romantic music more adequately than ever before—yet it seems to me the general tone, good as it is, could be that little bit better if the music were not in such a hurry to depart.

There has been a suggestion about the scientists and the musicians being set against one another, as in a sense they may be—although from the musical angle I think we all thank the scientists for their consideration in taking our view, and submitting us to questionnaires and so on. I have observed that scientists, on the whole, go for this full frequency and higher frequency, and produce what Mr. Blech said. They really like stringy tone that is also squally.

I notice that, not only in conversation with scientists, but with people who are wireless addicts who have superfine gramophones. In a gramophone shop last week a man turned on a vocal record in which the articulation of consonants in high frequencies was particularly well recorded, but it hissed like a fire engine. I said, 'Can not you get rid of that noise?' He looked at me as a headmaster looks at a boy who has committed an impropriety, and said, 'Oh yes, but if I did it would ruin the record, the articulation would go, the beautiful quality of tone and voice'. I said, 'I am awfully sorry, but I am rather vulgar, and I like big boom.' He turned it down, saying, 'Look at that'; to which I replied, 'All the same, I like it better'.

It seems to me we are trying to find out what we mean by fullness of tone. The scientist says, 'I mean by a full tone a tone which contains all the frequencies.' The musician says, 'I do not call that full, I call it squally'.

Mr. Norman Wilson: The first thing that springs to mind is this difference between brilliance, having an extended frequency range, and shrillness. Are we confusing

harmonic distortion with increased high frequency, because that happens on a rather bad gramophone? One turns up the top control until one has harmonic distortion as much as one can bear.

I also have noticed improvement in the Hall, particularly if you go about three times in a week. At the end of that time you go to a hall which a B.B.C. gentleman has described as 'tubby', and you realise what you have been missing of body in the Royal Festival Hall. Then you go back and get used to it again: it is purely psychological.

Mr. Henry Willis: I would like to endorse the statements of Mr. Harold Rutland and Mr. Howes. They reiterated what has been a general statement of opinion, that the new concert hall is lacking not only in resonance, but reverberation. Lack of bloom, fullness of tone, it is all the same, it is a shortened resonance and a very short reverberation. In view of the fact that three years ago recommendations were made to the appropriate authorities that a reverberation period slightly exceeding two seconds should be planned for, how is it that in the result we get a reverberation period which I have now heard suggested to be only three-quarters of a second?

Mr. Peter Sharp: I am a little perturbed about the general feeling everywhere that the reverberation period should be lengthened. I have enjoyed, for the first time in my life, contemporary music and Mozart and Haydn in a large hall. I have heard these works in smaller halls, and always enjoyed them. If we lengthen the reverberation time, we shall be back in the Albert Hall, minus the echo.

As to quality in the back of the Hall, it is variable in the back two rows, but better than the six rows in front of it. From Row O it is definitely varied. Standing at the back is better than sitting six rows in front. I have noticed a bass resonance in most parts of the Hall on the timpani. If Sir Malcolm Sargent's view is adopted, it may become worse.

Professor Josef Krips: I would like to say I am delighted with the acoustics in this hall. I have conducted in nearly all the halls in Europe, and this new hall is the most perfect I know. You can hear in a real way the whole of the music. You can hear all the middle voices. The brass has to be very careful, and more still, the percussion. A real fortissimo in this hall from brass or percussion is not acceptable. When you are performing a work by Wagner or Richard Strauss you can never play the brass section more than between mezzo-forte and forte: fortissimo is impossible, otherwise you would not hear the strings and woodwinds.

In performances of classical and modern works you can hear the structure of the work, and realise what is going on. From my point of view, it is very happy for the conductor, because you can hear everything that happens in the orchestra. I think it is a good education for everybody, and the best thing done in this country for music, because this country has now a new start in performing everything. Each player in an orchestra, each conductor, each soloist, has a much bigger responsibility for his performance.

For this reason I offer you my congratulations on this hall.

Mr. Petrie: One speaker mentioned the difficulty of hearing under the balcony. One of the troubles is economic design, which can not allow the height from the floor to the bottom of the balcony.

As to lack of reverberation by low frequencies, it is not when the orchestras are playing pianissimo that we notice this; when the orchestra is playing forte we are hearing too much. There is not anything wrong with the reverberation time at high frequencies, but we are missing the effect of the double basses and lower-toned instruments that put a thin veil across what we have heard before.

Mr. Dennison (Arts Council): Nothing has been said tonight other than a general comment about the effect of the orchestral layout as it can be arranged at present on the platform. I wish that when the platform was designed and built it could have been made so that far more alterations in the size and depth of the rise could have been possible under the varying conditions in which concerts are given, so that conductors could have more freedom to deploy their forces on levels and at distances according to their own requirements.

Mr. Allen: I think, first of all, Mr. Parkin and Mr. Bagenal would want me to thank you very much for the very careful way in which you have commented on the musical attributes of this hall. It will be a great help to future designers.

To turn at once to the main point of the discussion, one thing strikes me: acoustics people have for a long time had views, though rather vague, about the length of reverberation required in a hall, and it has been customary to relate it to the volume of the hall. The American recommendations have been, on the whole, shorter than the English recommendations. We have heard so many times tonight that the reverberation in this Hall should be longer, but only just a little longer, that we are probably near to having one accurate point on our curve. That would be such a nice thing in such an indeterminate world as musical acoustics.

Three-quarters of a second was not the correct figure for the Festival Hall: it is 1.7 seconds. Mr. Willis says somebody must not have accepted a recommendation originally made for two-and-a-quarter seconds. He ought to have seen the piles of material that came out of that Hall during the course of the test concerts. The fact is, the reverberation time in that Hall is very nearly as long as it could be, considering the size of the audience, for the audience is the principal absorbent. The only way to get much longer reverberation is by more volume, which costs money and increases the risk of echoes. In the course of study it may be that we can think of something else to do here, and you can rest assured that the architects of the Hall and the L.C.C. will give every sympathetic consideration to the things that have been said tonight, but I do not think anybody can promise anything. It is a problem.

Much has been said about the canopy. We need a large volume, but if we have a high hall without a canopy over the orchestra then you are going to introduce the risk of echoes from overhead. You must also have a reflector low enough to enable the players to hear themselves. That is why one sees a canopy even in a new hall. It resolves a conflict.

One of the things which has surprised us has been the favourable criticisms of choral music such as the Monteverdi Vespers, etc. That is a puzzling thing: we have always believed that we needed a long reverberation for these, but clarity proves to have merits.

Warmth, climax, and fullness: I am sure the consensus of opinion here tonight is understood by everybody.

On the arrangement of orchestras, and the weaknesses of the middle register, Mr. Stokowski's rearrangement of the orchestra had a number of curious effects. By putting all the strings on the left, the wind band was automatically moved to the right, in the position commonly used by second fiddles. One of the things Mr. Stokowski said about that afterwards was that it gave the wind band a chance. It enabled the audience to single out individual players, who frequently have interesting and important solo parts but are lost in the middle of an orchestra and difficult to identify visually or aurally, and he thought it a good position for the wind band; also the antiphonal effect between strings and wind band seemed very acceptable. It also seems to strengthen the strings and conforms to Sir Henry Wood's dictum about facing the f's outward.

We have not heard the last of the question of orchestral arrangement. It is quite clear it affects the acoustics of music as the audience hears it. That kind of consideration is going to have to be studied by the orchestra managers. It appears now that the exact arrangement of an orchestra is not a matter upon which conductors feel so very strongly. They appear to be willing to work with quite a number of arrangements, and are very flexibly-minded for the most part. It may be that all they have been seeking up to now is some clear acoustical ideas to guide them.

The last two speakers began to bring in 20th century music. I was disappointed that so much emphasis seemed to be put on 17th, 18th and 19th century music. Twentieth century music and a 20th century hall have something in common, and I feel that we might have heard more about this, especially as it seems to be the view of some critics that clarity is especially valuable for contemporary orchestration.

The Chairman: This has been a most interesting meeting, but I feel we need a little more time for judgment. There was, for instance, the point someone made about the musicians themselves not yet feeling at home in it. I do not think it will have completely fulfilled its purpose until they do so, as I am sure they will, in time.

Fire Protection: the Architect's Responsibility

By Eric L. Bird, M.B.E., M.C., A.R.I.B.A.

Read before the Royal Institute of British Architects on 27 November 1951
Mr. Martin S. Briggs [*F*], Hon. Secretary R.I.B.A., in the Chair

ARCHITECTS HAVE ALWAYS been aware that they have a primary responsibility for the fire safety of the buildings they design. That responsibility is not lessened by the fact that careless or unscrupulous owners may subsequently invalidate the safety measures incorporated in planning and construction. In recent years, however, the overall problem of fire protection has been altered and extended by research and by new features in urban and community living which call for a new survey and a new assessment of the architect's part in its solution.

First, architects no longer regard themselves solely as designers of single buildings which inevitably used to be set in solitary state amid an agglomeration of unplanned, speculative construction. Today, through town planning, they are operating in a wider sphere. The neighbourhood unit, the civic centre, the industrial area—even the whole town—have become their business. Inevitably they are as much responsible for the fire safety of the urban area as they are for its other characteristics, such as its density, its traffic circulation, its daylighting and air, its amenities and its appearance. Their concern with the individual building, of course, remains.

Secondly, during the last half century there has been a marked growth in the size of individual buildings, particularly in the centres of cities. Today an office building with a population of upwards of a thousand persons is not remarkable; hospitals have become huge centralised curative establishments; the audiences in public assembly buildings tend to be much larger than a half century ago; factories, following the rapid extension of industrialisation, cover much greater floor areas than they did when the steam or gas engine was the sole source of power. This tendency has introduced a corresponding increase in the difficulty of preventing the spread of fire through enormous interiors. More important, the problems of crowd handling and means of escape have become greatly magnified.

Thirdly, the bulk of goods stored for the use of ever larger urban communities has greatly increased. Many of these goods are themselves combustible, or the materials used for wrapping them are. The chance of huge fires beyond the control of the most efficient fire brigade has steadily grown.

Fourthly, and most important, a fire in a warehouse or factory is no longer merely a spectacle for the populace and a rebuilding job for an architect and builder. The loss of production capacity, of manufactured goods or of raw materials is a loss to the nation, particularly to one like Great Britain, which lives by manufacture and commerce. In the recent Gladstone dock fire at Liverpool, goods valued at upwards of a million pounds were destroyed. Such a valuable collection of eggs in one basket is by no means uncommon today. The building which houses so much stored money or productive capacity may cost no more than a few tens of thousands of pounds, but even its loss is important when the activity of the building industry is rigidly limited by close control of capital expenditure. Today the nation simply can not afford fire waste.

How great is this fire waste? The insurance companies report an annual loss of some £20,000,000, but that figure takes no account of consequential losses. It does not reveal that a factory gutted by fire is out of production for a year or more; that its employees, even in these days of full employment, are at least for a time in receipt of unemployment pay; that replacement of destroyed raw material means a demand on shipping space. Moreover, government-owned buildings and stores—with certain exceptions—are not insured; their loss is borne by the taxpayer. The total annual bill for fire waste in fact can not be stated in figures, but clearly it is far too large.

The Growth of Fire Protection Technique

Although it is as old as civilisation itself, the technique of fire protection first began to assume its present form in the second half of the 19th century. Fire disasters and loss of life were beginning to grow to catastrophic proportions. The Tooley Street conflagration in 1861 and the Exeter Theatre fire of 1887, when 200 persons lost their lives, are examples among many of the disastrous fires which afflicted 19th century Britain. The public became increasingly uneasy about fire danger, and a concerted move was made towards improvements, in which the architectural profession took its part.

The Fire Offices' Committee of the tariff insurance companies was formed in 1868, and soon started tests of fire-extinguishing appliances and fire doors, work which was later extended to the fire resistance of elements of structure. The British Fire Prevention Committee, which included leading architects, was formed in 1899, and was active until 1924. The bulk of the material on this subject in the R.I.B.A. Library consists of the publications of this committee.

Largely as a result of the research work and propaganda of these two bodies, much legislation was passed. The Public Health Amendment Act, 1890, various Factory Acts, the Celluloid and Cinematograph Film Act, 1922, as well as private acts such as the London Building Acts gave various authorities powers to control construction and means of escape in respect of fire. It is sometimes overlooked, also, that the Model Building Bye-laws are concerned with fire resistance as well as with sanitation and stability of structures.

In 1935 the Fire Offices' Committee opened their Fire Testing Station at Elstree, following the publication of British Standard Definitions for Fire Resistance, etc. in 1932.* These two events started truly scientific fire research in this country; previously it had been largely empirical in character. For the first time full scale elements of structure—columns, beams, walls and floors—were submitted to a standard fire test. The Station was financed and operated by the F.O.C. though the staff of the Building Research Station were permitted to use it. During the last war the activities of fire defence and fire raising gave great impetus to research, and in 1946 the government and the F.O.C. together reorganised the whole work under the control of two bodies.

The first of these two bodies is the Joint Fire Research Organisation of the Department of Scientific and Industrial Research and the Fire Offices' Committee, now commonly known as the J.F.R.O., initials which should be as well known to architects as are B.R.S. The Fire Offices' Committee presented their testing station at Elstree to the new organisation, and new buildings are now being provided there. The J.F.R.O. is unique in being a joint concern of government—the D.S.I.R.—and industry—the F.O.C. At the same time the latter established the Fire Protection Association as an independent body to study fire technology generally and to give advice. Thus the whole subject is now in the hands of two organisations which work in close co-operation with one another.

It is now fully recognised that fire protection is a many-sided affair and that no one class of persons or profession can be wholly responsible for it. On the one hand, fundamental research into the fire resistance of elements of structure and the fire properties of various substances as well as many other matters are the business of the Joint Fire Research Organisation. On the other, the building occupier, whether he be a householder, warehouseman or theatre manager, has his duties in respect of the storage of combustibles, the handling of

* British Standard 476, 1932. British Standard Definitions for Fire-resistance. Incombustibility and Non-inflammability of Building Materials and Structures with Addendum, July 1945, on 'Surface spread of flame'.

potential means of igniting them and the proper maintenance of means of escape. On him the Fire Protection Association turns its guns of propaganda. The architect comes between: he has to provide buildings that confine a fire, that will not themselves burn readily, from which unimpeded escape is possible, and which are so planned in relation to other buildings that fire can not spread readily from building to building.

I think it is not unfair to say that the architectural profession today does not take the interest in the fundamentals of fire protection that it did in the days of the British Fire Prevention Committee. Architects generally seem content to apply existing regulations, though they frequently grumble at them. The subject receives perfunctory treatment in the schools of architecture and in the R.I.B.A. examinations. Admittedly, the leading local authorities, such as the L.C.C., do provide the public, through their regulations, with a reasonable standard of personal safety and they not infrequently require the employment of fire-resisting construction to limit the spread of a fire and consequently the damage it can cause. But regulations are rigid and tend to become out of date; moreover under many of the smaller urban authorities they are often imperfect and occasionally non-existent. However, whether controlled by regulations or not, most architects follow good practice in construction and the planning of means of escape, on lines such as those laid down by the L.C.C. But I think they need a better understanding of basic principles and a knowledge of research findings to obtain that element of reasonableness which most building regulations in this country require. So equipped, they can argue with the local authority official on his own ground, they can avoid the risks which one sometimes sees incurred with new materials and forms of construction, and most important of all, they can make a positive contribution to advance in fire protection technique. The architect has one great advantage in this last respect; he is trained to see all round a problem and to incorporate the ideas of the specialist into a workable, economic building. Fire protection is only one of the factors to be considered in a building project. All specialists are liable to be extremists, and where an architect can argue a point from first principles and in relation to the other factors to be considered in a design there is most likely to be general all-round progress. Most architects can speak from first principles on matters of planning, stability of structures, lighting, sanitation and acoustics, but very few on fire protection.

The architectural profession, and especially teachers of architecture, will doubtless view with aversion the growth of yet another technique affecting building and demanding a place in an overcrowded curriculum of training, but fire protection remains a problem of national importance to the solution of which architects are specially qualified to contribute.

Defence against Fire

The community protects itself against the fire menace and its financial consequences in three principal ways. It pays insurance premiums; it maintains brigades of highly trained professional fire fighters; it controls construction and planning. Although this paper is concerned mainly with the third way, the other two call for brief mention

British insurance is so reliable that no-one ever calls it in question. This has not always been the case with some foreign concerns and, as a result, the British companies do an enormous business overseas. Indeed, insurance is one of our more important invisible exports and a great earner of dollars. The discounts on premiums granted by insurance companies where proper measures of fire protection are taken (an example is the 50 per cent discount for sprinkler systems) is a powerful incentive to their adoption, and therefore an influence in the reduction of fire waste. Here I might point out the desirability of architects consulting insurance companies on a project when it is in the design stage to ensure that their clients obtain the most beneficial insurance premiums.

The technique of fire fighting has been brought, in the last half century, to a high degree of efficiency and organisation. The powered fire appliance, together with the telephone and the street fire alarm, has become a strong, counteracting influence against the general growth in fire hazard. The Fire Service, however, can never provide the complete defence against attack by fire, though in its 40,000 or so responses to calls per annum it has greatly reduced in recent years the proportion of fire outbreaks which become unduly destructive or result in loss of life. The work of the Fire Service is too complex for justice to be done to it in a paper such as this. The squirting of water on a grand scale is only the most spectacular function of a highly organised operational service with an elaborate technique.

One item of Fire Service work calls for special mention here. The Fire Brigades Act, 1947, made it the duty of local fire authorities (counties and county boroughs) to provide guidance on matters of fire protection. The Fire Protection Officer of the fire authority is an adviser whose services are free to architects and building owners, and who may well be called in to look at plans in their early stages and to advise on them. The Fire Brigades Act is administered by the Home Office which, moreover, has always played an important part in fire prevention and fire protection.

Automatic means of extinction are also a powerful agent in keeping down fire losses. First in importance is the sprinkler system, which annually saves a volume of damage that can not be measured and which, not being regarded as news, passes almost unnoticed. There are also other forms of automatic extinction with special industrial uses. Sprinklers are used rather more in the United States than in Great Britain, for example in hotels. The new United Nations building in New York is

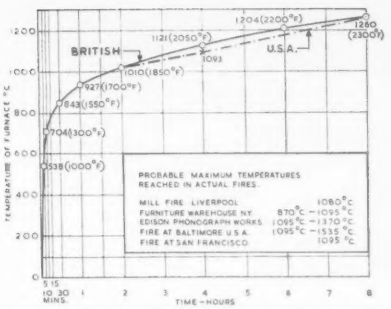


Fig. 1: The B.S.D.476 time-temperature curve which defines the standard test fire

sprinklered throughout. Because of their efficiency in extinguishing incipient fires, sprinklers can make tolerably safe the enormous buildings which are erected today with extensive areas of undivided floor space.

Mention should also be made of automatic fire alarms, which are of special use in locked stores or in buildings which are largely out of use at night or during weekends. They are relatively inexpensive and, operating as a result of rapid temperature rise, give instant warning of an outbreak which might otherwise remain unnoticed until too late.

The Fire Testing of Structural Elements

Turning now to that part of the subject which more directly concerns architects, we come to the work which has been done at Elstree since 1935. It was to ascertain precisely the fire resistance of elements of structure that the Fire Testing Station was established. It was first desired to know the degree of resistance to fire of common elements of structure such as 9 in., 11 in., or 4½ in. walls, the ordinary joisted floor, reinforced concrete floors, etc. Many other tests have followed since.

A first step in this study was a definition of terminology and the determination of what constituted an average fire and how such a fire could be simulated in a standard or repeatable manner. Against such a standard fire, structural elements could be tested and compared with one another. This was done in the inter-war period by a committee of the British Standards Institution, on which the R.I.B.A. was represented, which produced *British Standard Definitions No.* 476. This document is the essential basis of all fire testing in Great Britain. Its principal feature is the 'time-temperature curve' which defines a theoretical fire in terms of a growth of temperature in time (Fig. 1). The curve was built up from certain temperatures recorded or deduced in actual fires.

The next step was to build suitable furnaces with accurate controlling mechanism so that the temperatures could be created in them following precisely the times of the standard curve. Also it had been realised many years earlier that elements of structure themselves should be tested and not the individual materials of which they are composed; moreover this could only be done with any degree of

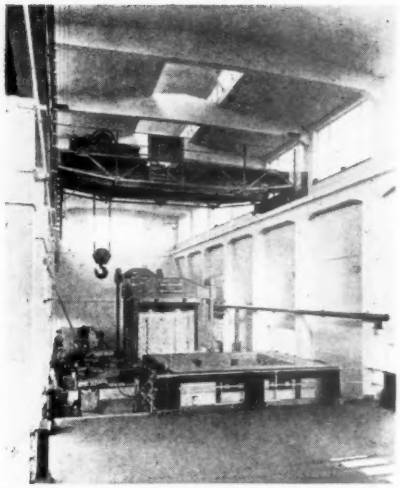


Fig. 2: Interior of the main laboratory at the Fire Testing Station, Elstree. The floor furnace is in the foreground and behind, the wall furnace and column furnace

certainty at full scale. Consequently the furnaces had to be large. Three furnaces were therefore built at the Elstree Fire Testing Station, one for columns, one for walls, partitions and doors, and one for floors and beams (Fig. 2). The furnaces are gas fired and electrically controlled. This gives the high degree of accuracy which is necessary if various elements are to be compared with one another and according to the standard curve. The B.S. 476 test also prescribes certain loading and water tests which it is not necessary to detail here.

The result of a test is stated in terms of time, namely, how long a given element of structure will withstand without physical failure or the transmission of heat (beyond a prescribed degree) the steady build-up of the standard fire in the furnace and continue to perform its designed function. Elements of structure that have been tested are therefore graded in *hours* according to their performance. B.S.D. 476 lays down the following grades: Grade A, 6 hours; Grade B, 4 hours; Grade C, 2 hours; Grade D, 1 hour, and Grade E, ½ hour. The practical uses of these gradings will be discussed later.

It will be realised that this work, apart from wartime interruption, has of necessity been slow. Nevertheless, a large body of results has been built up covering most of the elements of structure in common use. A comprehensive report on results is to be published shortly by the Stationery Office under the title of *Fire Tests on Structural Elements*. A condensation of results is given in *Post-War Building Studies No.* 20. *Fire Grading of Buildings, Part I*, and in Pamphlet No. 5, *Fire Resistance Grading of Elements of Structure*, published by the Fire Protection Association.

Some Typical Examples of Fire Resistance of Structural Elements

The following very generalised notes will give an impression of the relative fire behaviour of ordinary structural elements.

Walls. 9 in. and 11 in. brick walls in bricks of clay, sand-lime or concrete are Grade A. A 4½ in. wall, plastered both sides, is Grade D. Partition block walls, varying in thickness from 4 in. to 2 in. and of different classes of aggregate, range from Grade C to Grade E. Solid wood-wool slab partitions, 2 in. thick and plastered both sides, are Grade D.

Floors. The ordinary 9 in. by 2 in. joisted floor with ⅞ in. t. and g. boarding and lath and plaster ceiling is Grade E. The resistance of the solid rod-reinforced concrete floor depends partly on the thickness of cover to the steel, but mainly on the overall thickness. A properly constructed 3½ in. thick r.c. floor attains Grade E, a 5 in. floor is Grade C, and a 7 in. floor Grade A.

Columns. The 8 in. by 6 in. R.S. stanchion without protection failed in 11 minutes. A protection of 4½ in. brickwork, with web spaces filled, raised it to Grade A. The normal 2½ in. r.c. protection (1 : 2 : 4 mix and Class I aggregates) gave Grade B; a similar protection 1½ in. thick gave Grade C. A protection of plaster 1 in. thick on expanded metal lathing gave Grade D.

It will be seen that this research work has made possible the design of structures possessing specific predetermined fire performances. The next step was to determine the maximum heating to which structural elements are likely to be subjected in various classes of building. This brings us to the question of the amount of combustible material likely to exist in each class of building and the maximum fire severity that will be generated by its burning.

The Fuel of a Building Fire—The Fire Load

It is commonly said that a building burns, whereas truly a building fire has two fuel components, namely, the combustible substances in the contents and any combustible parts of the structure of the building itself. The fuel content arising from the occupancy may be, and usually is, of much the greater importance. The substances comprising most occupancies are commonly both easier to ignite and contain a greater bulk of combustible material than do the more usual forms of structure, though there are, of course, exceptions. Therefore in determining the degree of fire resistance of a given building at the design stage, the use to which that building is to be put is of first importance.

All the occupancies commonly met with have been studied and classified. They are classified in two ways, namely, according to the ease with which they can become ignited and according to the amount of heat their burning will produce. Those that are most easily ignitable are termed 'abnormal', by which is meant that a fire originating in them can grow at abnormal speed. Abnormal occupancies present special problems in regard to extinction and speed of escape. A list of abnormal materials and occupancies is given in *Post-War Building Studies No.* 20 (Appendices I and II).

The potential evolution of heat in a building fire is termed 'the fire load'. It is

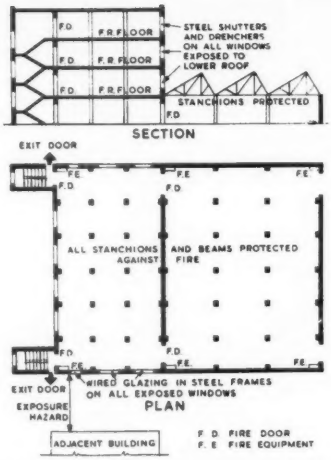


Fig. 3: Diagram illustrating the application of compartmenting. This building has four compartments in the multi-storey section, and one in the single storey. Note the methods of preserving the integrity of all compartments against a fire in any one of them and that there are two escapes from each compartment

computed by measuring the weights (in lb.) of the combustible materials, multiplying them by the calorific values (in British Thermal Units) and dividing by the floor area (in sq. ft.). Average fire loads have been worked out for the majority of common occupancies, as in Table I, which gives some typical ones. More information is given in *Post-War Building Studies No.* 20, p. 17, where the broad classification into 'Low Fire Load', 'Moderate Fire Load' and 'High Fire Load' is adopted.

Table I

Occupancy	*B.Th.U. per sq. ft.*
Hospital ward ..	8,000 or less
Residential ..	27,200
School classrooms ..	29,600
Office occupancy (with light files) ..	58,400
Library	200,800
Heavy file store ..	332,000
Textile factory ..	200,000
Textile warehouse ..	500,000
Book store (filled) ..	2,000,000
Rubber warehouse ..	2,000,000 and more

The Use of Fire Resisting Construction

The research work which I have briefly outlined makes possible the provision of structural elements which are known to resist the burning out of the contents. The basic purpose is economy in building costs. For example, there is no need to protect the steelwork of a block of flats with 1½ in. of reinforced concrete because this gives Grade C protection, whereas the calorific value and weight of the contents demand no more than a Grade D protection, which can be obtained with plaster on metal lathing. On the other hand the contents of a warehouse may demand Grade B or even Grade A, in which case a protection of 1½ in. of reinforced concrete to steelwork

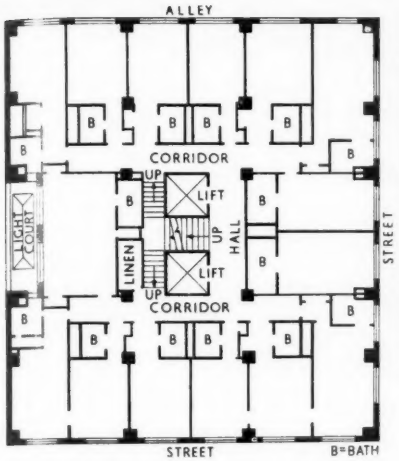


Fig. 4: Typical bedroom floor plan of the 15-storey Winecoff Hotel, Atlanta, Georgia; the 'classic' case of 'flue effect'. Fire spread from the second floor up the unenclosed staircase. The structure was otherwise fully fire-resisting. Casualties, 119 dead and 100 injured

will be inadequate and the building may be totally destroyed with all its contents. Some redesigning of floors and added protection to columns could achieve the appropriate higher grade at relatively small cost.

The proper use of fire-resisting construction is to confine the fire and prevent it spreading throughout the building or to adjacent buildings. Therefore fire-resisting elements of construction should be used to form compartments which are fire-tight as far as is practicable. This means that compartment walls, floors and supports in a fire-resisting building should have the same minimum grade of fire resistance. Also, staircases, lift shafts, ducts and doorways between compartments should be protected with appropriate fire doors to prevent the spread of fire by what is termed 'flue-effect' through them (Fig. 3). There is no special virtue in construction that will not transmit or withstand fire if it is not used to form compartments. Some of the most disastrous fires have occurred in fire-resisting buildings where doorways, staircases and lift shafts were not properly cut off (Fig. 4). Compartmenting is an essential in the huge modern building of today.

Architects practising in London will be well aware of the way in which these principles are applied by the London County Council. The L.C.C. require a compartment to be not larger than 250,000 cu. ft., and they specify with precision the means whereby doors and lift shafts are cut off as well as the construction to be used to form compartments. Lack of adequate precautions against 'flue effect' in large buildings—the spreading of smoke and hot gases up the stair wells and lift shafts—is, in my opinion, one of the most serious defects in present-day planning, though not, of course, in the area controlled by the L.C.C. In the provinces I have noted frequently the absence of proper

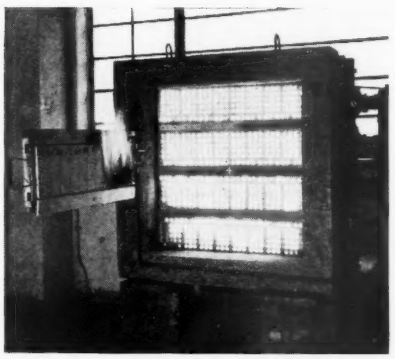


Fig. 5: Furnace used for the B.S.D. 476 Spread of Flame Test. The specimen in a frame (on the left) is preheated by radiation (as in an actual fire) and ignited at a corner. The rate of flame spread across the specimen is timed

cut-off doors at the main staircases of multi-storey hotels and office buildings. It is not enough to cut off only the escape staircases, as is frequently done, because flue effect up the well of an unenclosed main stair or lift shaft can fill upper corridors with smoke or hot gases so that the occupants of rooms may be unable to reach the escape staircases.

It is debatable how far the installation of a sprinkler system reduces the need for compartmenting. Most authorities agree that compartments can be made materially larger, though readers of *Post-War Building Studies No.* 20 will observe that there is a minority report on this point. Some large industrial buildings can not conveniently be compartmented at all in their main interiors. Here the best course is to install a sprinkler system. All buildings having abnormal occupancies, that is to say those which are subject to very rapid growth of fire, should be sprinklered.

The Spread of Flame Test

During the last war there was added to B.S.D. 476 a test for assessing the rate of flame spread across the surface of materials. This addition was made necessary by the growing tendency to use as linings to buildings (i.e. as substitutes for plaster) various sheet materials, the fire properties of which were imperfectly appreciated. A series of disastrous fires, where the lining material was observed to spread flame very rapidly, brought this matter into prominence. The test classifies materials into four groups: Class 1, *Surfaces of Very Low Flame Spread*; Class 2, *Surfaces of Low Flame Spread*; Class 3, *Surfaces of Medium Flame Spread*; Class 4, *Surfaces of Rapid Flame Spread* (Fig. 5).

Sheet materials obviously meet a demand for wall and ceiling linings that are less costly and more rapidly fixed than ordinary plaster and, in some cases, provide a better degree of thermal insulation. But architects should pay attention to the possible grave increase of fire risk through a widespread use of those in Classes 3 and 4. *Post-War Building Studies No.* 20 discusses these

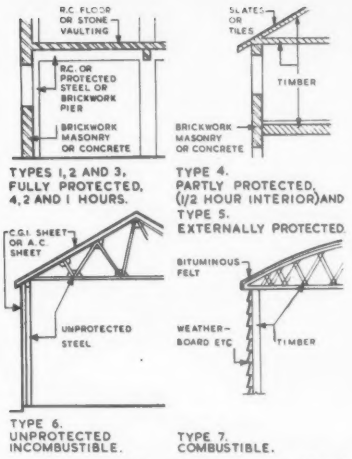

R.C. FLOOR OR STONE VAULTING
R.C. OR PROTECTED STEEL OR BRICKWORK PIER
BRICKWORK MASONRY OR CONCRETE
TYPES 1, 2 AND 3. FULLY PROTECTED, 4, 2 AND 1 HOURS.
SLATES OR TILES
TIMBER
BRICKWORK MASONRY OR CONCRETE
TYPE 4. PARTLY PROTECTED, (1/2 HOUR INTERIOR) AND
TYPE 5. EXTERNALLY PROTECTED
C.G.I. SHEET OR A.C. SHEET
UNPROTECTED STEEL
BITUMINOUS FELT
WEATHER-BOARD ETC
TIMBER
TYPE 6. UNPROTECTED INCOMBUSTIBLE.
TYPE 7. COMBUSTIBLE.

Fig. 6: Diagram illustrating the classification of British types of structure in terms of fire resistance as agreed by the Fire Grading of Buildings Committee and described in *Post-War Building Studies No.* 20

materials and the problems they introduce, specially with reference to their influence on ease of escape (paras. 262-5).

Fire Grading of Buildings

The Fire Grading of Buildings Committee, which was set up jointly by the Building Research Board and the Fire Offices' Committee, produced in 1946 a report which I have mentioned several times previously, *Post-War Building Studies No.* 20. This report takes all the work I have outlined to its logical conclusion, namely, the classification of building types according to their fire hazards and the specification of appropriate grades of construction for each. I do not propose to summarise this report, but to leave it to those who have the enterprise to read it.

There is one point, however, that should be mentioned. Fire Grading postulates the restriction of user to certain classes of construction. Up to the present most local authorities, such as the L.C.C., have required one (or two) types of fire-resisting structure of high grade because they could not control change of occupancy. They have had no power to prevent, say, a block of flats being used for other purposes. With the much closer control of building now being exercised through town planning, this kind of uncontrolled change of user is beginning to disappear and the way is becoming open for the proper application of fire grading. Already one can say that the chance of a local authority-owned block of flats being turned over to another use is virtually nil.

The Fire Grading of Buildings Committee agreed that British building structures could be classified into seven types in terms of fire-resistance (Fig. 6). Types 1, 2 and 3 are fully fire-resisting (or 'protected' to use the Committee's term) for 4, 2 and 1 hours respectively, and are desirable for buildings with high, moderate and

Fig. 7: Test at the Fire Testing Station of the spread of flame on the walls of a corridor lined with a Class IV wallboard

low fire loads. Type 4 has ½ hour resistance, and is in effect what is termed 'traditional' construction. Type 5 is the same external construction, but inferior inside. Type 6 is the steel framed and sheeted industrial structure which is incombustible but not fire-resisting. Type 7 is the wholly combustible building.

Recognition of this classification and its adoption by designers is still in the future. Meanwhile, the classification has certain obvious advantages: it provides architects with guidance as to the type of construction that should be used to house a given occupancy; it should enable local authorities to determine the general constructions they will or will not sanction in various kinds of urban area: it should help to ensure that a given building has consistent fire resistance throughout and is not fatally weak in one feature. At the same time, because it sets standards of performance and does not necessarily specify materials, it does not impede the architect's choice of materials nor his freedom in design.

The Dwelling House

The effect of recent changes in the construction of small buildings, including those employing prefabricated methods, requires consideration. The dwelling house is, of course, the outstanding example, though these methods are used for other buildings, notably schools. The traditional house of brick or stone, tile or slate, joisted and boarded floors and plastered walls and ceilings has a fire performance that is fairly good and gives reasonable time in which occupants can escape or be rescued. For the normal two-storey dwelling, I see no reason why a higher standard should be demanded. But any constructional changes which might result in a lower standard require careful study.

The J.F.R.O. maintain a nation-wide statistical service covering all aspects of fires. A study of the incidence of fires in post-war houses has revealed that there have been proportionately four times as many serious fires in permanent non-traditional houses (of all types) as in traditional houses: in other words, the prefab. has been, so far and on the average, four times as fire-hazardous as the traditional house. There is, however, no need for the occupiers of prefabs. to panic about this because the relative frequence of outbreak in all types of house built since the war is less than in those built before it. But there have been some rapid and fierce fires in certain types of prefab. with regrettable loss of life.

There seem to be two principal elements in these prefab. fires. The first is the use of combustible linings for interior surfacing instead of plaster or plasterboard; some of these have been in Class 4 'Rapid Flame Spread' (Fig. 7). The second is the substitution of a metal flue pipe in a casing for the customary bye-law brickwork flue. There is, of course, no reason why a construction because it is prefabricated should be any more fire-hazardous than a traditional one; in my opinion, the potential fire behaviour of the prefab. designs was insufficiently understood just after the war, although the report of the Burt Committee was clear enough on the point. Variations in the construction of approved designs were sometimes made, with the result that risks were taken in ignorance. It is only fair to say that these risks are becoming recognised by those who are concerned with government sanctioned designs of prefabs. and are not likely to be taken again. So far as those already built are concerned, remedial measures are being undertaken, though perhaps at considerable expense. Nevertheless, this experience points the moral that departures from accepted methods of construction should not be made, nor should new materials be employed without a careful and fundamental study of the potential changes in fire hazard they may introduce. And it should be pointed out that the Joint Fire Research Organisation and the Fire Protection Association exist for the purpose of providing the detailed guidance necessary.

Conflagrations

Finally we come to what is primarily the town planning side of the subject. Throughout historical times towns have been ravaged from time to time by fires which, originating from a single source, have grown into uncontrollable conflagrations and which have resulted in widespread destruction, loss and dislocation of life. Our custom in Britain, since the Great Fire of London in 1666, of building with brick walls and slated or tiled roofs has saved us from the worst of these, such, for example, as those which have ravaged many American townships built with timber walls and shingle roofs (Fig. 8). We have, however, had them in commercial and industrial areas and may do so again, in spite of our efficient fire service, specially in those older, unplanned congeries of factories and warehouses which escaped destruction in the war (Fig. 9).

In planning and building new towns and parts of old towns we ought to make sure that the resulting built-up areas are conflagration-proof. This is not difficult in normal small house development, provided we avoid the use of combustible roof surfaces on a wide scale. But the tendency to zone for specific uses may result in the creation of conflagration hazards in commercial and industrial areas. In the days before town planning became a controlling force, high fire risk factories and warehouses were not infrequently surrounded by areas of low risk dwellings which tended to isolate the occasional large fire. Today town planners zone buildings of these kinds into well-defined groups.

Fortunately, in central urban areas, the modern tendency to adopt open planning for reasons of light, air and traffic circulation, together with fire-resisting construction of the necessarily large buildings, helps greatly towards a reduction in the risk of conflagration. Factories, on the other hand, usually have top-lighting and are built close together; moreover, they are generally built with unprotected steel framework which is not fire-resisting, and they frequently house fire-hazardous processes or combustibles in large amounts. There is some danger that conflagration risks may be created in these planned industrial zones, if what experts call the 'exposure hazard' is not studied. Much useful work on exposure hazard has been done by B.R.S., and is now in the hands of the J.F.R.O. Information on this matter is also given in *Post-War Building Studies No.* 20. Alternatively, or in addition, the risk can be appreciably reduced by a general adoption of sprinkler systems in industrial areas.

Conclusion

In preparing this paper I have resisted the temptation to quote examples which would point a moral, even though some of them would be sensational and horrifying. No doubt the paper is less interesting because of this omission. Rather, I have tried to survey the subject objectively, to see whither our present-day habits and methods of building are tending and to indicate the extent of the architect's responsibility in fire protection and the nature of the contribution he can make to it.

DISCUSSION

Mr. S. H. Clarke (Director of the Joint Fire Research Organisation), in proposing a vote of thanks to Mr. Bird, said: If there had been present this evening an architect who had no idea of the importance of fire protection in buildings, he would have cause to be very grateful to Mr. Bird for the summary of the provisions which he has given us, but I am sure there is no such architect present, because in his opening words Mr. Bird said that from the beginning architects have regarded it as one of their responsibilities to see that adequate fire protection is provided in buildings. Nevertheless, I think that those who are present this evening, knowing as much as they must already know about fire, have equal cause to be grateful to Mr. Bird. In his very able survey Mr. Bird has put his finger on the high lights, and there is little that one would wish to add or to say in comment.

Mr. Bird pointed out that specialists are apt to get one-track minds, and he mentioned the architect's duty to see that the fire specialist does not make things too difficult in buildings. That I think will need

Fig 8: The burnt out area of the conflagration in 1914 at Salem, U.S.A. 1,600 timber framed and shingle roofed houses, as well as many other buildings were totally destroyed. The damage amounted to 14 million dollars

Fig. 9: A typical interior of a building block in the shopping district of a British town. Many similar examples exist in most British towns and cities; they are highly vulnerable to conflagration

attention in the fairly near future. Fire precautions are increasing; some of them appear to be good, but others are perhaps of questionable importance, and architects and those who have to deal with building design should see that these precautions are kept within reasonable limits.

I should like to mention one matter to which Mr. Bird did not refer but which is perhaps known to most of you, namely, that the Fire Grading of Buildings Committee, which has done so much to clarify the issues about which we have heard this evening, was formed a few years ago and Mr. Bird was one of its original members. Throughout the years during which the Committee has deliberated on this subject, he has maintained a very keen and vigorous interest in every part of its work. Mr. Bird was also one of the first members of the Fire Research Board, and on that body too he displayed vigour and forthrightness. I should like to take this opportunity of paying a tribute to the importance of his contributions in those early days.

Mr. W. H. Tuckey, O.B.E. (Director of the Fire Protection Association): It gives me very great pleasure to second the vote of thanks. All of us who are associated with fire protection and fire research look upon Mr. Bird as the architectural head of that side of the subject.

I agree with Mr. Clarke that some of our regulations require a little revision. Although I am naturally very keen on fire protection, I think some of the regulations go a little too far. We seem sometimes almost to use half the space of a small building for exits.

With regard to prefabricated houses, I found Mr. Bird's statement a little confusing. He says there is no need for the occupiers of prefabricated houses to be alarmed by the fact that the prefabricated house has shown itself to be four times as fire-hazardous as the traditional house, but when a fire starts in one we usually lose the whole house instead of the fire being confined to the room where it started.

On the question of metal flue pipes, their danger was so well appreciated by the Fire Offices' Committee many years ago that they were heavily penalised in all buildings by rates which made their use almost prohibitive. We have appreciated the great dangers and the inevitable results of using metal flue pipes instead of brick flues.

Mr. J. A. Spon [*A*]: I should like to ask Mr. Bird how serious the smoke problem is considered to be in large blocks of buildings, particularly blocks of flats. I have in mind the situation that arises when a fire starts at the bottom of the stairs and the smoke is conducted up the stairs by the shaft. The fire-resisting doors on the stairs are, of course, satisfactory in keeping off the flames themselves, judging by what I have seen of them, but I should think that there is a danger of a considerable volume of smoke getting into the corridors.

There is one point with regard to the architect's responsibility which I do not think Mr. Bird mentioned, that is, that the architect should plan the building so that the ways of escape are clear to everybody in the building. In the building in which I work I have often found people wandering about in the corridors, trying to find their way out, and I think that a large building in which there may be strangers at times should be planned in such a way that people are naturally led to the exits.

Mr. E. L. Bird: People are frightened of smoke. Firemen have many times gone up staircases and rescued people who could have got down without assistance. It is not possible to prevent smoke, and it will seep round the edges of doors. There is no such thing as an entirely smoke-free escape in a multi-storey building.

I have dealt very little with the question of escape in my lecture, because I assumed that architects knew a good deal about it. Certainly those who work in London have to do so, and escape technique in this country is on the whole fairly good. It is a very large and special subject.

Mr. Kenneth Bayes [*A*]: Mr. Bird spoke about timber frame buildings with shingle roofs. I should like to ask him whether, if brick walls are used, he still regards shingle roofs as dangerous. I believe that the insurance premium is not increased for dwelling-houses which have shingle roofs but are otherwise of traditional construction. I should also like to ask Mr. Bird whether he regards an isolated dwelling which has timber walls and a shingle roof as indefensible from a fire point of view.

Mr. E. L. Bird: When I spoke about shingle roofs I showed slides of conflagrations in America, where houses with shingle roofs were close together and in very large numbers; whole townships or whole districts were built of them, and that was the primary cause of the great and uncontrollable spread of the fire.

As to the individual timber-built house, about half the world live in them and we are a little exceptional in this country in building our houses very largely of brick with slate or tile roofs. I do not think that there is any particular reason why a house with timber walls and shingle roof should be more liable to an outbreak of fire than any other house. It is only where there is a large number of them together that there is the risk of a conflagration.

Mr. Richard Henniker [*F*]: I should like to ask Mr. Bird whether there are any figures which prove that there is a greater incidence of fire in timber buildings in the less humid climates. I think it is fairly obvious that cedar shingles, for instance, are much more likely to catch fire when they are subjected to a very strong sun and their moisture content is much lower than it would be in a climate like ours.

The architect obviously has a considerable responsibility in the planning of buildings from the fire aspect, but I have found that officers of local authorities are often extremely ill-informed on the present state of fire protection technique. I should like to know whether anything is being done to bring their information up to date.

Mr. E. L. Bird: I speak subject to correction by Mr. Clarke, who before he became Director of the Joint Fire Research Organisation was on the staff of the Forest Products Research Laboratory, but I believe that there are two elements in the rapid burning of shingle roofs and timber buildings generally. One is, as Mr. Henniker says, the moisture content of the timber, which is obviously considerably lower in the central areas of large continents like the United States than it is on the seaboards and in islands like ours; but in this country, in times of drought, timber on the outside

of buildings can have a moisture content as low as 6 or 7 per cent, which makes the timber easily ignitable. The other factor is that when one building is on fire it preheats or warms up its neighbours. That preheating is one of the important factors in the conflagrations which have devastated wooden townships in the United States.

My main knowledge of local authority officers is in connection with the London County Council, and I have always found that they know only too much about fire protection. I think it is very likely that some of the provincial local authority officers know very little about it, because the whole subject is still very largely in its infancy. The Fire Testing Station was established in 1935, and there is a time lag between doing research work and getting it applied in the field and all over the country.

Capt. P. S. Hudson [*A*]: There is one type of building that I have in mind, namely, the old-fashioned Georgian country hotel, of which we have so many in the provincial towns, and where we get a number of strangers or tourists. I should like to hear Mr. Bird's comments on that problem.

Mr. E. L. Bird: That is a difficult question. I am not an authority on hotels, except those that I have stayed in and looked at. I always make a point of seeing what the escape is from my bedroom, and I have slept in some hotels with a little degree of uncertainty about how safe I should be.

I think we have been lucky not to have had many serious fires in hotels. There was one in Manchester some time ago, about the end of the war, when eleven people were killed, but that was partly due to the fact that there was a canal on one side of the building and the firemen could not get the fire escapes up. Some of these old buildings are liable to be dangerous, but many of them have been in existence for several hundred years and have not yet been burnt down.

Mr. J. Godfrey-Gilbert [*A*]: I should like to ask Mr. Bird whether he would consider it an advantage, in dealing with housing estates, to have the first floors of houses of hollow block or other forms of concrete construction.

Mr. E. L. Bird: I think that fire protection is only one of several elements which have to be considered in any building project, and cost is another of those elements. If someone can produce a fire-resisting floor which is cheaper than and as good as the ordinary joisted floor, no doubt it will be used, but personally I think that the ordinary joisted floor, with its boarding and a plaster ceiling underneath, has a sufficient degree of resistance to enable the occupants to have time to escape or be rescued. As I said in my lecture, I do not think there would be any advantage in increasing materially above that the standard of fire resistance of the ordinary house.

Mr. Richard Eve [*A*]: I wish to refer to another aspect of this question, which I am very sorry that Mr. Bird did not mention, no doubt through lack of time. It is the incidence of fires (I believe the figure is a high one) caused by the unprotected open fire. This is a matter in which the architect can very easily assist by providing the little receptacles into which the fireguard can go, although he can not provide the fireguard itself. I am perhaps unduly influenced by the recent paper by Dr. Colebrook on the causes of burns and scalds which were examined at the Birmingham Infirmary. It was shown that a large number of these were caused by open fires, electric radiant heaters and unprotected gas fires. The architect can not do much with regard to the electric and gas fires, but with regard to the solid-fuel fire he can do a great deal by providing some place where the fireguard can be hooked into place. I believe there is also a very considerable loss of property from the same cause.

Mr. E. L. Bird: I have no figures on the subject to which Mr. Eve has referred, but I know that the Birmingham Survey has done a good deal of work on it, and it is undoubtedly an important matter. I have always wanted to obtain comparable figures for fires in dwellings in countries where central heating by radiators is used almost exclusively, such as Sweden, and for fires in this country, where we employ naked flame in coal fires and gas and electric fires. I have never been able to obtain those figures, but I should think that the incidence of fires is much greater in this country.

Mr. Eve may be interested to know that Mrs. Colebrook is present at this meeting.

Mr. W. H. Tuckey: I may say that we have published a booklet entitled 'Burns in the Home', which is really a reproduction of the paper by Dr. Colebrook to which Mr. Eve has referred. We should be glad to send a copy of it to anyone who asks us.

Mrs. V. Colebrook: I am very much interested in the problem of the protection of buildings from fire, and I have come here to find out how far the architect has it in mind. There does not seem to be any doubt that some accidents could be prevented if the heating of the house was studied from that point of view.

With regard to the figures for other countries, we have done a little research about that. My husband has produced a paper on that subject, which I shall be very glad to send to Mr. Bird.

Mr. H. V. Lobb [*F*]: I should like to ask Mr. Bird whether there have ever been published statistical details of the many causes of fires. That would, I am sure, give architects and the building industry generally an opportunity of checking up on the particularly vulnerable parts of buildings. It would be very interesting to know, for example, how many fires and what percentage of fires in this country are caused through electrical installation failures, and whether there is anything that can be done generally to an installation which is twenty-five years old in order to prevent that kind of thing. I think that Mr. Bird's account of the causes of fires in prefabricated houses should make architects consider this matter carefully.

I think it is a fact that a considerable number of fires have been caused by television sets. A television set has, for instance, been left on and pushed into a corner of the room, up against fabric curtains which were hanging down, and the curtains have caught fire. The heat which is given off by some television sets is very surprising and may not be generally known.

Mr. E. L. Bird: As I said in my lecture, the Joint Fire Research Organisation run a nation-wide statistical service, which I believe is the only one in the world that covers all the causes of fire in a most elaborate way, and of which you will find full particulars in the annual reports of the Fire Research Board. Electrically caused fires are 1 in 6.

With regard to television sets, the Joint Fire Research Organisation and the Fire Protection Association have done a considerable amount of work on this subject, and I believe that the television manufacturers have welcomed it. Television sets were originally built without any great regard for the question of fire, but now I think all modern sets show a considerable improvement. For the ordinary household the answer is, of course, to switch off at the plug and not on the set; better still, to pull the plug out.

Mr. R. C. Bevan (Building Research Station): Mr. Henniker raised the question of local authorities not understanding the technique of fire protection. No mention has been made this evening of the new London County Council bye-laws, which are the first attempt in this country to apply in practice the principles of fire grading which are set out in the Fire Grading of Buildings Report. As most of you know, there is at the moment a Committee sitting on the model bye-laws. I do not know what that Committee will produce, but it has an excellent background for formulating a proper scheme for the fire grading of buildings on the same lines as those set out in the recent publication of the London County Council.

There are one or two difficulties in the way of getting these principles applied in practice. One often hears that the Fire Grading of Buildings Report is too complex. One could publish a very simple book on fire grading and say: 'Everything shall be built of at least 9 in. of brick or 5 in. of concrete and 5 in. concrete floors, with $4\frac{1}{2}$ in. of brick round the flues.' That would provide a very good building, but when one wishes to use some other material one is immediately baffled by such requirements. It is only by referring to a system of grading such as Mr. Bird has described to us this evening that one is able to overcome these difficulties. We must have an appreciation of the principles of fire grading before we can have all the relaxations from the old restrictive regulations that used to be enforced.

Mr. E. L. Bird: I have only one comment to make on Mr. Bevan's excellent remarks, with which I agree wholeheartedly. I must apologise for not having made any reference to the new L.C.C. bye-laws and the fact that they are the first attempt in this country to put fire grading into effect.

Review of Films—26

The country of origin and date of release are given first. The film is in monochrome unless otherwise stated. The sizes (35 mm. and 16 mm.) are given. Sound films are marked 'sd', and silent 'si'. The running time is given in minutes.
(F) indicates free distribution.
(H) indicates that a hiring fee is payable.

Cornish Granite

Britain 1951 (*F*)

Summary. The processes involved in the production of Cornish granite and the ways in which it can be used. The qualities of granite; examples of the various grades of face finish from rock faced to polished surfaces; quarrying, splitting, dressing and fixing the stones with particular reference to the building of the river wall on the south bank of the Thames; slab facing work—sawing, polishing and fixing; examples of the use of granite in various structures.

Appraisal. A well-made, informative and interesting film which covers the subject clearly and systematically. The photography is good—particularly those sequences showing the preparation of the stone. A few more technical details would have added to the value of the film for some audiences. Generally an impressive and most useful film.

16 sd. 35 sd. 22 minutes. Cornish Granite Films Ltd., 55 Dingwall Road, Croydon, Surrey.

Houses in the Town

Britain 1951 (*F*)

Summary. Problems of layout and grouping connected with varying types of housing schemes and the way in which their solution affects the character of new developments. Types of buildings being erected in Great Britain; new solutions to old problems; possibility of variety even at high densities. A scheme for Hackney demonstrated: models used to show ways of siting houses, bungalows, and flats, etc., to achieve character. These ideas illustrated by reference to the reconstruction work at Poplar.

Appraisal. A clear description of the present trends in urban development, all the more convincing for the sincere way in which the subject is treated. The commentary is clear, interesting and authoritative and the photography generally is of a high order, good use being made of models. Planning and presentation are excellent; a stimulating film which should be of particular value to housing committees of local authorities as well as to the general public.

16 sd. 18 minutes. Central Film Library, Government Building, Bromyard Avenue, Acton, W.3. (U.K. 1276.)

Above: Robert Matthew [*A*] starring in *Houses in the Town*. Below: A still from *Cornish Granite*

Book Reviews

Laboratory Design. National Research Council report, etc. Edited by *H. S. Coleman.* [Articles by *R. A. Wank* and others.] 11¾ in. ix + 393 pp. + front. text illus. New York: Reinhold Publishing Corporation; Lond.: Chapman and Hall. [1951.] £4 16*s.*

Recent years have seen a considerable growth of interest in scientific research and the increase in official support for such activities has made the scientific consideration of the problem of laboratory planning a matter of great importance.

In the past, many laboratory buildings have consisted of monumental structures, often impressive externally, but filled with a random collection of fittings and equipment which fail to fulfil the functions required of them and even hamper the activities of the scientists working there. This state of affairs is mainly due to the fact that research workers sometimes find it difficult to give a clear picture of their requirements, and few architects have given sufficient study to the real needs of the laboratory user. In spite of the urgency of this subject there is very little material published on laboratory design, and the few books available in English are largely out of date.

This new work published in America by Reinhold under the editorship of H. S. Coleman, Chairman of the National Research Council's Committee on the Design, Construction and Equipment of Laboratories, is therefore a book of consequence. In 1924 the National Research Council of the U.S.A. set up a committee to study chemical laboratory design, the resulting report being published in 1930. The committee was temporarily disbanded in 1943, but in 1947, when it was reconstituted, it was given the task of preparing a new report to replace the 1930 edition. *Laboratory Design* is the product of this commission's labours, and the contents have been contributed by American technical and scientific specialists.

The book comprises four main sections. The first deals with interior construction materials, equipment, services, and safety precautions. Part two considers the special problems of teaching laboratories from site selection to internal arrangement, and includes chapters on the various types of teaching laboratories in general use. The third section deals with industrial laboratories, including research, analytical control and pilot plant units for a wide variety of industries. A chapter of this section is devoted to the design of laboratories where radio-active material is used. The final section gives a concise description of twelve modern laboratory buildings.

The 42 chapters of the book are generously illustrated with both photographs and drawings, although the latter leave considerable room for improvement. The 400 odd pages cover practically the whole field of laboratory design and provide an immense source of information for architects and others concerned with the construction of laboratory buildings. In some ways the review of modern laboratories (Part 4) is the least satisfactory section of an otherwise excellent volume, for in many cases the architecture is ponderous, lacking in imagination and badly detailed, while the plans shown are generally inadequate and crudely drawn. Attention must be drawn, however, to the Illinois Institute of Technology by Mies van der Rohe, the Reed College Laboratory by Pietro Belluschi, and the Drake University Laboratory by Saarinen. These three buildings are excellent examples of collaboration between scientist and contemporary architect, resulting in laboratory buildings which not only function efficiently, but look as though they do.

This book can be strongly recommended to architects engaged in the design of laboratories, in spite of its high price in Great Britain. EDWARD D. MILLS [*F*]

Architectural principles in the age of humanism, by *Rudolf Wittkower.* (Warburg Institute Studies, vol. 19.) 10¼ in. xi + 144 pp. + 41 pls. text illus. The Institute. 1949. £1 15*s.*

There are some books published which, owing to the depth of their specialised learning, could only be reviewed quite adequately by their authors. This is one. It is Vol. 19 in the Studies of the Warburg Institute of London University, in which Dr. Wittkower acknowledges some assistance from Otto Kurz, Ernst Gombrich and others. Perhaps that is why there is a ponderous thoroughness about the volume, and the density of the footnotes on every page makes it exhausting to read. The effort, however, to grasp the meaning of most of it is helped by 41 pages of photographs of buildings or reproductions of their designs.

A continual reference to Alberti and Palladio links the four essays in the volume. The first of these is a study of the centrally planned Renaissance churches as opposed to the earlier Latin cross form. We are told how the conception of the former was taken as a symbol of God, rooted in Neo-Platonic philosophy. Palladio's exquisite little church at Maser (north of Venice) is perhaps the perfect instance. This is followed by a study of Alberti's idea of the proper use of the column, the pillar and the pilaster; and the rest of the book is devoted more or less to Palladio—his definition of an architect, his geometry and the theory underlying his designs, especially the church façades. As well, the whole business of Renaissance æsthetics regarding the relation between music and architecture is discussed minutely; and I must confess I found some quotations from Francesco Georgi unintelligible and Alberti's generation of ratios almost a bore—even though, to them, the analogy between audible and visual proportions was more than theoretical speculation and even if it testified to a solemn belief in the harmonic mathematical structure of all creation. Probably it did, and it is sad to discover, as the author tells us, that it was in England that 'the whole structure of classical æsthetics was overthrown from the bottom'. Hogarth began it in 1753; then Hume, in his essay *Of the Standard of Taste*, said 'Beauty is no quality in things themselves, but exists merely in the mind which contemplates them.' Burke, too, tore to shreds the classical conceptions of proportion; and Lord Kames, in 1761, made a frontal attack on the translation of musical consonances into architecture. Finally Richard Payne Knight, in 1805, found a pseudo-logical proof to show that musical harmony and spatial proportion can not have anything in common.

Nevertheless, though Ruskin declared that possible proportions are as infinite as possible airs of music and that it must be left to the inspiration of the artist to invent beautiful proportions; and though Julien Guadet said 'pures chimères. Il m'est impossible, vous le concevez bien, de vous donner des règles a cet égard'. Dr. Wittkower's book will, I hope, do something to counteract the tendency to deliberate disorder in modern design. A translation of his historical thesis into a much simpler exposition of the main theories, with clear diagrams, might attract our young architects momentarily from the pursuit of ungoverned experiments in engineering.

A. S. G. BUTLER [*F*]

Wanderings in London, by *Ebbe Sadolin*. 9½ in. 170 pp. incl. pls. text illus. Methuen. 1951. 15*s*.

Sadolin is known in Denmark as a writer, widely travelled, witty and observant; but *Wanderings in London* is his first book in English and it is a notable début. The profusion and outstanding quality of Sadolin's own pen-and-ink illustrations account for much of this book's success, but so does careful choice of subject. While famous scenes are included, most are off the tourist's beat, but all are London to the life. The Players' Theatre; an East End graveyard; a 'local resident' with newspaper, upturned boots and all, 'resting' on a bench; a flat-chested soldierly Chelsea pensioner; bomb damage in the Temple; a bird-lover elegantly feeding ducks; a junk-shop and a narrow lane full of interesting architecture. These are only a few.

Under 'Restaurants, pubs, teashops and clubs' the Dorchester is sketched discreetly from Hyde Park, the Café Royal as a Naughty 90's interior, naughtier than it is; the sumptuous scene at Simpson's is conveyed by an outline of the carver taking 'the best cut off the joint with all the *sang-froid* of a surgeon'; a simple drawing of a tea service newly deposited on your table includes the author's numbered key and witty directions for uninitiated strangers. Of the Pride of Denmark, Sadolin says: 'Here the architects have accentuated various things which make the English pub such a cheerful and pleasant place,' and his drawing shows how well he has understood this combination.

He gives a clear-eyed portrayal of street and park morals, again with convincing pictorial evidence, and implies that London permits freer behaviour than other big cities.

He draws buildings better than many architects and has an unusually sharp eye for good townscape. While no doubt the Danish P.E.N. possesses in him an able member, his absence from the ranks of M.A.A. must somehow be an omission!

F. R. STEVENSON [*A*]

A Study by the . . . Bemis Foundation, *&c*., **The Prefabrication of houses,** by *Burnham Kelly*. 9 in. xxii + 466 pp. incl. pls. + pls. text illus. New York: Wiley, and M.I.T. Technology Press. London: Chapman & Hall. 1951. £3.

This book is a work of painstaking and methodical research made over a period of many years by a number of Research Assistants of the Bemis Foundation for Housing Research at the Massachusetts Institute of Technology. It is an exhaustive analysis of the prefabricated housing industry in the U.S.A. and should be read by all connected with the building industry in this country, both for the material it contains and for the light it throws on the methods of approaching large-scale housing production.

The work is divided into two parts. The first deals with the development of the industry, past, present and future. The second covers in great detail the management, design, ordering of materials, production and marketing of prefabricated houses in the States. In January 1948, 82 separate plants were in operation.

But the author is concerned also with broader issues. He points out that the distinction between prefabricated and conventional construction may well become meaningless in the next few decades. He sees prefabrication as a stage in the industrialisation of the whole building industry, prefabricators as among the first to use new materials, new structures, new methods of manufacture, and prefabricated housing as a forerunner of future building.

He foresees amongst other developments manufacture of components wholly within the factory and work on the site restricted to assembly, interior partitions replaced by storage walls, honeycomb sandwich materials 'produced by the mile', and an efficient and economical chemical toilet with or without the re-use of water which could eliminate sewerage systems and revolutionise town planning. He reiterates that designs suitable for brick building which are mixed, cut, spread, fitted and patched on the site are quite unsuitable for buildings made of units which are clipped, snapped and bolted together in the field, that good design requires as well good management, intelligent ordering of materials in advance, efficient production and effective marketing, if there is to be real success.

Prefabrication of houses in this country is as yet regarded as a temporary expedient and has largely been abandoned in favour of the continuance of traditional construction. We should analyse our successes and failures in this field, for only by developing prefabrication can building be industrialised to increase output sufficiently to overcome the present housing shortage. In such a study we have much to learn from American experience, and Burnham Kelly's book may well become a standard work of reference.

BRUCE MARTIN [*A*]

Kunstschmiedearbeiten aus der Schweizerischen Schlosserfachschule in Basel. Wrought Iron Work, *&c*., by *Paul Artaria*. 9¾ in. 12 + 1 pp. + (99) pls. Basel: Wepf. 1950. Swiss Fr. 9.50.

When the 18th century blacksmith made a bar of wrought iron into the satisfying designs we associate with tradition, he was working quite unselfconsciously within existing technical limitations and in step with the æsthetic climate of his time. Today, few would deny that an awkward discord often exists between handicraft and those impersonal techniques which contribute so largely to the really contemporary building. Nothing looks more unfortunate amid the kind of detailing which springs from an intelligent and sympathetic use of machine techniques than the near *pastiche*—the arty gate, grille or balustrade.

In this industrial civilisation, the apotheosis of forged iron must come from the artist—not the craftsman, for the craftsman is mostly concerned in making a *thing*, while the artist is involved above all else in communicating an *idea*. A technically outdated material, such as wrought iron, may offer the artist just those qualities he needs to communicate his idea, and the choice of a material or technique rendered uneconomic by contemporary development will not affect the issue. But the work of the craftsman must always carry the stamp of contemporary technical authenticity if it is to be wholly convincing.

Judged by these standards the examples illustrated in this book never convince. Behind every design lies the dead æsthetic of the craftsman who worked before the

days of mild steel, the arc welder, the power grinder and the oxygen cutter. It may well be a good thing for the students, whose work is illustrated, to practise the craft of hand forging before passing out as fully fledged locksmiths; but only by a vigorous acceptance of the tools at his elbow and all this implies can the contemporary metal worker hope to turn out craftwork having the vitality and conviction which are essential if it is to stand comparison with the best examples of the past.

The really contemporary metal gate or grille is most likely to be turned out by a craftsman with an oxygen cutter in one hand, the starter button of a drop hammer under his foot, and the vigorous æsthetic of Paul Klee's 'intent' at the back of his mind. COTTERELL BUTLER [A]

Monmouthshire Houses, &c. Part 1: Medieval houses, by *Sir Cyril Fox* and *Lord Raglan*. (National Museum of Wales: Welsh Folk Museum.) 10¼ in. × 8¼ in. 114 pp. + 20 pls. + folding pls. text illus. Cardiff: the Museum. 1951. 17*s*. 6*d*.

This work is the outcome of an intensive survey of the smaller houses of rural Monmouthshire, undertaken in the years 1941-48 when Sir Cyril Fox was Director of the National Museum of Wales. Lord Raglan was a Member of the Council of the Museum, and is now Chairman of its Art and Archaeology Committee.

The work will eventually be in three parts:

Part I (now published). Medieval houses, c. 1415-1560.
Part II. Sub-medieval houses, c. 1550-1610.
Part III. Renaissance houses, c. 1590-1700.

Part I deals with cruck-trussed wooden houses and small stone houses and their siting. Examples are described in the form of a factual record amplified by learned inference where necessary, and the authors have given to the smaller rural houses in this part of the country the degree of research more normally devoted to the larger houses. The approach is in the main a structural one, but some interesting sociological conclusions are drawn; for example, that the medieval single room 'hall' houses were built by substantial farmers as important family centres, undoubtedly served by lesser lightly-built appendages for cooking, spinning and other domestic purposes. Nor do the authors overlook the architectural appeal of a succession of great cruck trusses seen in an ill-lighted barn at Cwrt-y-Brychan, Llansoy, 'with their broad, smooth continuous expanses of timber subtly curved upwards, unbroken by moulding or ornament, from sill to ridge.'

It is not claimed that lowland Monmouthshire has any local characteristics in small house design or building method, except perhaps that the feet of the cruck blades are unusually slender. The zoning of types of building technique in different areas, normally dependent on the materials most readily available, can only be discovered when such surveys are undertaken on a country-wide basis, and for this reason county boundaries have no great significance. It is to be hoped therefore that the authors will continue their researches over a wider field, or that others will follow their example.

In its presentation, Part I is open to some criticism. Main sections pass from one to another in mid-page, with small italic titles hardly distinguishable from paragraph headings. Architects may also feel that the lettering in the text figures could have been in better style. The drawings are, however, carefully placed in relation to the text.

LOUIS F. HURLEY [A]

Designers in Britain. *Society of Industrial Artists*. Vol. 3. 1851-1951. 12 in. × 9½ in. Allan Wingate. 1951. £2 5*s*.

Every two years the Society of Industrial Artists publishes *Designers in Britain*, a book where stock is taken of the achievements in the fields of graphic and industrial design in Great Britain. In this year, 1951, the third of these volumes has been published.

When a society which admits members according to the quality of their work elects a committee to select designs for this book, it is not surprising that the result is of a high standard. The encouraging fact is that this standard seems to rise with each volume. There are fewer poor examples than in the earlier volumes; the bulk of the work shown is good, and a sizeable proportion of it is excellent.

The long struggle to get good design recognised as a necessity is at last showing results, and is bound to gain momentum as prejudices are overcome. Those manufacturers who do not see any other reason for good design will eventually be forced to employ designers in order to compete with those who do, provided, of course, that designers on their part become more realistic about questions of economy and public appeal. After all, their clients are first of all business men, whose concern is to sell in such quantities that the setting up of costly tools becomes an economical proposition. The designer who is able to meet this very real requirement without in any way sacrificing his own artistic integrity is still very rare. The work by students shown in the book suggests that this point is stressed in those schools where, for the first time, designers are being properly trained.

Designers in Britain is split up into two parts: *Design for Marketing and Publishing*, with an introduction by Milner Gray; and *Industrial Design*, introduced by Nikolaus Pevsner. It is interesting to compare how very much more successful British designers are in some of the fields which fall under these main headings than in others. Outstanding, for example, even by international standards, is British exhibition design, radio cabinet and book design. Perhaps not quite so remarkable but steadily improving are furniture, light fittings and wallpapers. Least successful are the designs of china, glass and silverware.

In some fields of industrial design, judging by their absence from the book, designers seem not to have been employed at all; notably motor-cars, sanitary fittings, architectural ironmongery (all of which could be better designed), scientific instruments and gas cookers (most of which are very good).

The book itself, as were its two predecessors, is beautifully designed by Peter Ray, and free from the usual clichés of 'art book' production It is not only a useful reference book but has also considerable propaganda value. *Designers in Britain* is playing an important part in bringing nearer the day when it will not only be possible to fill 250 pages of a book with good design, but also (and this, alas, is not yet the case) the shops and stores of this country. PETER MORO [F]

How to Estimate, &c., by *John T. Rea*. 11th ed. With . . . increases in costs of materials and labour, &c. 8½ in. xxi + 716 pp. + folding pl. text diags. Batsford. 1951. £1 1*s*.

Rea's has long been recognised as a comprehensive standard work on building costs. Unstable economic conditions still make a complete revision impracticable, and the present book is largely a re-issue of the 6th (1937) edition. Up to date (September 1950) tables are included, however, giving full details of costs of materials and rates of labour, and wherever possible other corrections have been made.

On the Making of Gardens, by *Sir George Sitwell*. Reprint. 8½ in. xix + 76 pp. + xvi pls. New York: Scribner's; Lond.: Duckworth. 1909 (1951). 15*s*.

One need not be an expert gardener to appreciate this charming Edwardian survival, first published in 1909; but those who know about the art of garden design, or at any rate the design of Italian Renaissance gardens, will probably agree that Sir George knew his subject, although his judgment in this, as in the many other matters on which he was so peculiarly informed, was sometimes tempered by ferocious prejudices. His elder son contributes a graceful introduction, and the book is illustrated with sixteen *Country Life* photographs of the gardens mentioned in the text.

Hampton Court. How the palace was built, by *Iris Morley*. With drawings by Paul Hogarth. 9¾ in. (ii) + 30 pp. text illus. Hampton Court: Chetwynd Books. 1951. 2*s*. 6*d*.

A charming little history-cum-guide that reflects equal credit on author, artist and publisher. Inexpensive too. J. C. P.

Thirteenth Century Domestic Architecture in England, by *Margaret E. Wood*. (Archæological Journal Vol. CV. Supplement.) 10 in. iv + 150 pp. + 13 pls., one folding. Plans and photographs. Rl. Archæol. Inst. 1950. 12*s*. 6*d*.

The appearance of Miss Margaret Wood's dissertation on Domestic Architecture in England in the 13th century has been eagerly awaited, and its completion is a matter of congratulation to the author and to the Royal Archæological Institute, which has published it as a separate volume for sale to non-members. Miss Wood's detailed account of the houses of the 12th century proved her capacity to pro-

duce the long needed authoritative survey of the domestic architecture of the Middle Ages in this country on which she is engaged, and it is a pleasure to record that her second volume has brought her a doctorate of the University of London.

Much has, of course, been written on individual buildings since Turner and Parker's classic work on the subject, but Miss Wood has gathered many additional examples and has visited, recorded and reassessed them with an industry and fidelity that can not be too highly praised. All relevant detail has been carefully examined and set forth, and the whole is presented with scientific precision and an admirable economy of words.

In some ways the particularisation of domestic building and its separation from ecclesiastical, military and civil architecture is arbitrary, since monasteries, collegiate churches, castles, colleges and hospitals all had their living accommodation, which was as fully domestic as the manor-house or yeoman's dwelling. But it is the private house that has been least studied, and its function separates it in many ways from the larger apartments designed for communal life. Miss Wood has been wise in not confining her study within too narrow limits, and she has not hesitated to include border-line examples that assist her exposition.

The book deals with some seventy separate buildings arranged in counties, and it is surprising how much they differ from one another in plan although their elements are fairly constant. As Miss Wood observes, the builders of the 13th century assembled the parts of their houses as a collection of buildings rather than as compact structures. But the social life of the time prescribed a certain relationship between the parts, and the medieval architect (if we may give him this late title) could always be trusted to arrange his design with dignity and beauty. The value of the book is greatly enhanced by Miss Wood's plans and photographs, which illustrate many of the less generally known buildings.

WALTER H. GODFREY [*F*]

A Pocket Guide to Modern Buildings in London, by *Ian McCallum.* 5½ in. × 4½ in. 124 pp. incl. pls. Architectural Press. 1951. 3*s.* 6*d.*

Ever since the pre-war booklet by Hugh Casson (published by the L.P.T.B.) went out of print, a new pocket guide has been urgently needed. Ian McCallum's fills the bill splendidly. The author does not claim that his is a complete catalogue, but few will, I think, be able to discover any important buildings omitted. A bibliography is included, and there are also indexes to architects, building types and geographical locations. The well-intended, but oversimplified, maps will confuse rather than assist the visitor unfamiliar with London, and the appearance of this most useful publication is homely, to say the least. Otherwise nothing but praise. J. C. P.

Correspondence

'THE BUILDER' LOW-COST HOUSE

Sir,—I must protest at the disingenuous nonsense which is once more being written about the £1,000 houses now completed in Northampton, and which I was astonished to find repeated in the JOURNAL. Messrs. Womersley and Hopkinson must themselves be embarrassed at these claims. They have achieved successfully what they set out to do—that is to design and build four houses at about £1,000 each. To pretend, however, that they represent a 'high standard of construction, comfort and amenity' is to beg the whole question of what we mean by standards of comfort and amenity. Further, to pretend that the saving in cost is achieved by 'a simplification of plan', and by the 'elimination of wasteful halls and passages' is to commit the cardinal error—at any rate for architects—of kidding ourselves and our colleagues, to say nothing of the general public.

It is possible to say that present-day standards of planning, performance and amenity in housing are too high. That is, however, a contention which is highly controversial and by no means proven. At least one can say that the houses in question fall below, and seriously below, these standards.

First, let me deal with the 'elimination of wasteful halls and passages!' Quite apart from the picture such a phrase conjures up of the average architect's house simply honeycombed with winding passages, all that has actually been done is to take half the hall and dump it in the living room, where it adds nothing to the useful floor area, increases the cubic space to be heated to living standards, and leaves a lobby at the foot of the stairs where it is clearly impossible to remove an overcoat without skinning one's knuckles and from which the unfortunate host has to retreat into the living room before the guest can enter the house.

This expedient in fact reduces the area of the living room to an actual usable 176 sq. ft. instead of the 206 figured in the plans.

With this there is provided a kitchen of 83 sq. ft. in which it is quite impossible for the family to have any meals whatever. This fully justifies the usually unjustified gibe so often levelled at architects that they haven't the slightest idea of the real requirements of the overworked housewife. Moreover, since the effective living room is less than 180 sq. ft., no part of this can be regarded as dining space. The fuel store is placed in the airing space so that every time fuel is delivered or the scuttle filled, dust settles on the washing and the cooker in the kitchen is so placed that the unfortunate housewife works in her own light.

Upstairs, while the bedrooms may be adequate by some unspecified standards (those of 1937 perhaps?) they are certainly below the standards accepted since the war. Added to this, one of the principal amenities of the post-war house, the built-in cupboard, has been omitted, except in the third bedroom, where it could normally well be left out and where it has been inserted—according, I agree, to normal practice—to hide a thundering big bulkhead. The omission of these cupboards involves the use of separate wardrobes, which will still further reduce the bedroom area. Lastly—and this time I think the architects should be criticised by any standard—the W.C., for a family of five, has been placed in the bathroom.

In conclusion therefore, sir, I do beg that, while again not denying the success of the architects in achieving their aim, we shall not as responsible architects, or you as a responsible journal, conceal the fact that the result is a sub-standard house both in planning and in amenity.

Architects must, I suppose, keep their bread buttered, however thinly, and we may be forced to submit to outside pressure and retreat from the decent standards we have worked to in the last few years. I very much hope we shall fight against such submission, but if we must so retreat, for heaven's sake let us not try and kid a contemptuous world that we are really advancing backwards.

Yours faithfully,

KENNETH J. CAMPBELL [*A*]

Editor's Note.—Mr. Campbell seems to suggest that the JOURNAL is expressing approval of a policy of departure from Ministry housing standards. In support of this he quotes part of a sentence from our article. The whole sentence is: 'The houses illustrate the high standard of construction, comfort and amenity which can be provided at costs and rents 25 to 30 per cent lower than those at present being built to full Ministry standards'. Apart from the somewhat careless phrase 'high standard' this is a statement of a fact generally agreed by those who have inspected the houses.

The reduction of total superficial areas is an objective towards which the Ministry have been moving in recent months, one of the methods being 'elimination of wasteful halls and passages'. This is now official policy and is set out in Circulars 38/51 and 70/51. Some Ministry designs are illustrated on page 64 of this JOURNAL.

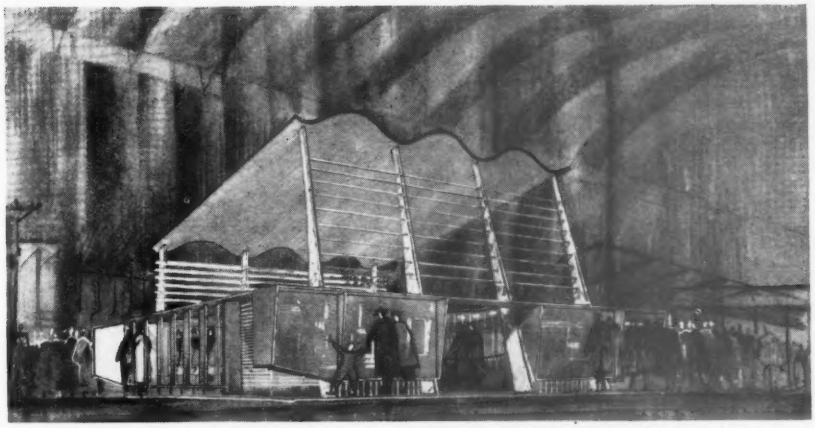
Mr. Campbell also lumps together Ministry requirements and customary planning practice under the heading 'decent standards'. On many points of house planning practice there is nothing like unanimity of opinion among architects, though he assumes that there is.

Any attempt to solve the housing problem is, in our opinion, worthy of serious study even if it involves objective re-examination of everything that is today considered desirable or is even a Ministry standard. We reported this competition as a contribution to that study and are well aware that architects are quite competent to form their own opinions on it without any suggestions from us.

The Building Exhibition, 1951

At Olympia, 14-28 November

Part I.



The stand of the Timber Development Association, designed by J. R. M. Poole [*A*], had a stressed plywood roof of high strength to weight ratio

Introduction

The size of the Building Exhibition this year required a full day of industrious activity on the part of the architect visitor if he were to inspect the majority of the stands. Even then, he would have been likely to miss many interesting items. The JOURNAL is therefore repeating its practice of reporting the newer developments rather than listing or describing the many products which are in everyday use and therefore well known to architects. If, therefore, certain well-known firms and products do not appear in this series of articles, it will not be because they were overlooked nor because they are considered unimportant, rather the contrary. The architect has his regular sources of supply in the form of firms which provide him with a continuing service, but now and again he meets a new problem or finds a new way of solving an old one, and these, we feel, are the points on which he should find information in the JOURNAL.

Conversation with manufacturers revealed that most of them were doing excellent business and they were well satisfied that the time and money they had expended on the exhibition were well spent. If this is what can happen in a time of restriction of capital expenditure, one wonders what the exhibition and building activity in general would be like in a building boom, supposing such an unlikely event were to materialise.

There was no doubt that architects attended the exhibition in unprecedented numbers. The R.I.B.A. Club had a constant stream of visitors, particularly at tea-time when seating was a problem. It was noted in the Club that a few members had failed to use their A.B.S. tickets at the turnstiles, thus depriving the A.B.S. of Mr. Montgomery's donation; it is to be hoped that they will remember in future!

Pyrok

An important newcomer to the exhibition was Pyrok Ltd. This may be taken as an indication that this novel surfacing process is now firmly and actively established in the building industry. It was in October 1947 that the JOURNAL made the first announcement of the development of Pyrok, and many readers may have wondered what had happened to a process we described as 'revolutionary in the field of surfacing'. At the time of our article, Pyrok Ltd. was but newly formed, patents had just been filed and the company possessed one experimental spray gun and mixer. It has taken four years to build up an organisation covering the whole country—and, indeed, several Dominions and foreign countries as well—with local licensees, trained operatives and adequate plant, and to carry through a programme of official tests with the Building Research Station, Joint Fire Research Organisation, National Physical Laboratory, etc. Moreover, teething troubles are bound to arise with any new development, and these had to be got over in field experience. We are so accustomed to taking industrial services for granted that we are liable to overlook the importance of the organisation behind a material which can be mentioned in a few sentences in a specification. Between the first specimens of a new material and a full service of availability on any job there is a world of work, and it is perhaps surprising that Pyrok Ltd. have got through the greater part of this stage in so short a time as four years.

The material Pyrok embodies exfoliated vermiculite, an inert mineral which possesses remarkable thermal properties. Vermiculite has been known for some years and has been the subject of experiments, but it was Mr. Samuel Clipson, the inventor of Pyrok, who discovered how it could be embodied in a surfacing material and applied with a special spray gun (Fig. 1). He found that when the mix was properly made and applied by gun the resulting material had surprising properties of adhesion, anti-condensation, freedom from cracking and stability, as well as the insulating and fire-resisting qualities given by the vermiculite.

Pyrok appears to be now launched safely as a building industry service, and is being extensively employed on wall and ceiling surfaces internally and as external renderings. There are other possibilities ahead; the company has already developed foamed Pyrok and plaster Pyrok, the uses of which are being explored. The address of Pyrok Ltd. is 40-42 Nine Elms Lane, London, S.W.8.

Hand-printed tiles

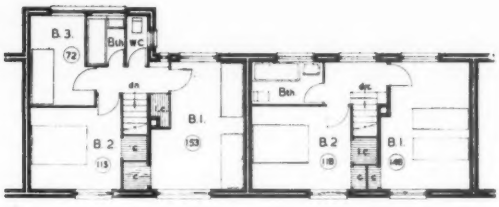
The Carter Group have introduced a new decorative tile which is hand-printed, a process that enables special designs to be reproduced and so offers a medium for architects and other designers in which they can have their decorative schemes realised. The technique can also be applied to tiles for exterior use. Panels on Messrs. Carter's stand displayed a variety of patterns carried out by hand-printing, ranging from formal patterns to more individual motifs. Inquiries about this new technique should be addressed to Messrs. Carter and Co. Ltd., Poole, Dorset.

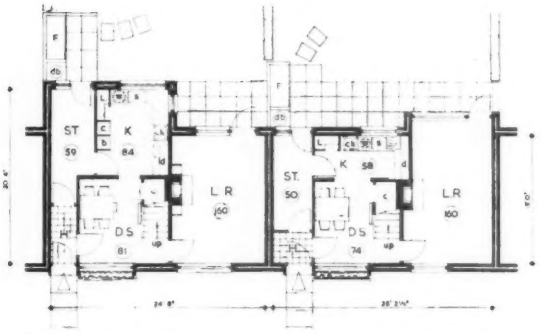
Displays by Government Departments

This year the various government departments concerned with building adopted the policy of illustrating a few important items of research work rather than trying to cover the whole field of their work. For instance, B.R.S. demonstrated the use of small tower cranes in house building which they said gave considerable reduction of time in erecting house carcases. Another item was aerated concrete, on which they have recently produced an excellent film which is to be viewed shortly by the R.I.B.A. Films Panel. Full-scale models also demonstrated good and bad parapet construction.

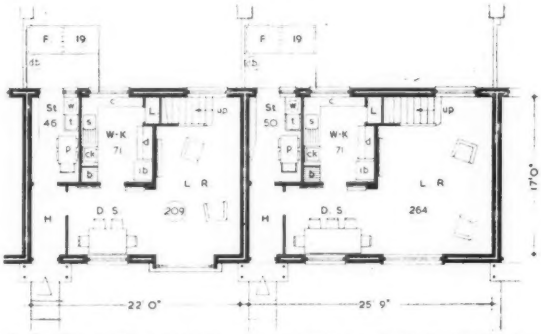
The Forest Products Research Laboratory illustrated their work of investigation into the properties of the many lesser-known Empire hardwoods now being brought into use. Not all architects know that they can obtain information on these from the

Fig.1: Applying Pyrok with the special spray gun to Colterro lathing

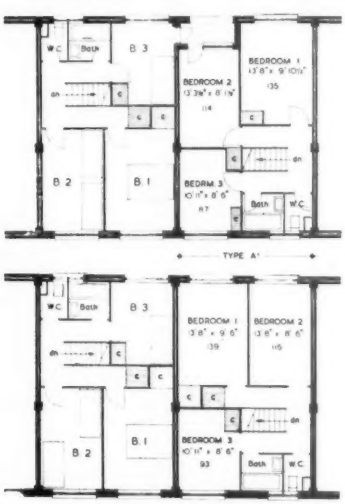




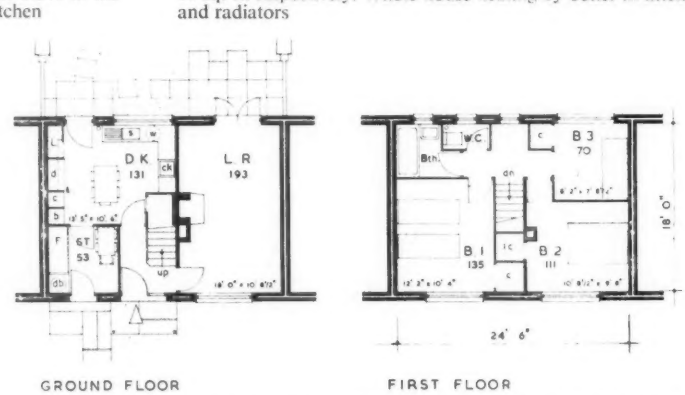
Left: Type B1, 5 persons; net area 826 sq. ft. Right: Type B2, 4 persons; net area 722 sq. ft. The stores and fuel add 71 and 62 sq. ft. respectively. Heating by improved fire or stove in the living room and radiators in dining space and kitchen



Left: Type A2, 4 persons; net area 774 sq. ft. Right: Type A1, 5 persons; net area 826 sq. ft. The stores and fuel add 65 and 69 sq. ft. respectively. Whole house heating by boiler in kitchen and radiators



A new type maisonette, the cross-over, reduces the number of main staircases and lifts in high blocks



Type F1, 5 persons; net area 829 sq. ft. The store adds 53 sq. ft. Heating by improved fire

Fig. 2: Plans of new designs of houses and a maisonette shown by the Ministry of Housing and Local Government. Publication of these designs follow the issue of Circular 38/51 advising local authorities on methods of reducing costs without departing from Housing Manual standards

F.P.R.L. The Joint Fire Research Organisation showed how the floors of dwelling houses are tested for conformity with standards of fire resistance and how modern timber floors can be constructed to obtain them. The Ministry of Works illustrated their Technical Information Service, which is still not sufficiently known in the industry. The Bulletins and Special Reports of the Ministry are useful sources of information to architects which are comparable in value with the B.R.S. Digests. They are obtainable from the Stationery Office.

The new policy of 'space savings gained by eliminating passage space' in houses, put forward by the Ministry of Housing and Local Government, was shown in several models and photographs and attracted a good deal of attention. Comparative plans showed the saving; for example, two plans with the same room areas had overall areas of 1,050 sq. ft. and 882 sq. ft., a reduction of 168 sq. ft. A new type of maisonette, 'the cross-over', was also shown by drawings and a model; its principal advantages are a reduction in the number of staircases and lifts in high blocks and an avoidance of external access balconies. Plans of some of these designs are shown in Fig. 2.

Fuel Economy

Today a common method of heating and supplying hot water to the small house, particularly the 700 to 800 sq. ft. four-person and five-person types, is the continous-burning open fire with back boiler.

The fire warms the single living room and the boiler supplies a couple of radiators upstairs and provides the hot water. With a central flue stack the system is inexpensive to install, pipe runs being short, and efficient in operation. The principal drawback is obtaining hot water in the summer; for this an immersion heater is usually fitted in the storage tank. Such a heater in an unlagged tank can cost quite a lot to run, at least for the household whose family income is £5 to £6 a week.

The Electrical Development Association's stand had a full scale mock-up of such an installation, including an immersion heater, which showed how simple it could be. But they made a feature of the need to lag the tank in order to keep down the cost of current. For this, three 30 gal. tanks were shown near the installation. One was unlagged, and it was stated that it wasted 342 gal. of hot water per week by radiation. The second had a 1 in. thick insulating jacket which reduced the heat waste to 76 gal. per week. The third was encased in slag wool held in place with fibreboard, making a total insulation thickness of 3 in.; here the heat waste was no more than 27 gal. per week. This striking comparison showed in an unusually simple manner the value to be obtained from insulation. Lagging the flow and return pipes also contributes to saving of solid fuel, while keeping the draw-offs as short as possible also saves both solid fuel and electricity. To the housewife who says she likes a nice, warm linen cupboard it should be pointed out that most linen cupboards are overheated, and can cost quite a lot of money to keep at a temperature of 60 or 70 degrees.

The Finch Preformed Chimney Throat Unit

The Finch Organisation of Belvedere Works, Barkingside, Essex, who market, among many other things, coal-burning fireplaces, have concerned themselves with some of the faults that commonly arise with modern fireplaces because of the division of responsibility between the fireplace maker and the builder. The principal trouble lies at the throat, where the maker's responsibility ends and the builder takes over. This often shows itself in a weak 'pull' to the fire, emission of smoke into the room and, with continuously burning fires, cracking of tiled surrounds. To overcome this they have evolved a pre-cast throat unit which is simply and easily built into place above the fireclay back. The section (Fig. 3) shows its principal features. It has a streamlined smoke passage of correct size to give the necessary quick upsurge above the fire to prevent emission of smoke below the lintel, and there is an insulating void which prevents the conduction of heat to the tile surround; asbestos rope is also placed between the front edge of the unit and the back of the surround. The unit is designed to allow the correct flat smoke shelf to be provided at the back. It is interesting to note that this design puts into practical form design rules for fireplaces laid down by Count Rumford in the 18th century. The unit, which is made of pre-cast concrete with a high alumina content costs from £1 9*s.* to £1 15*s.*, according to size.

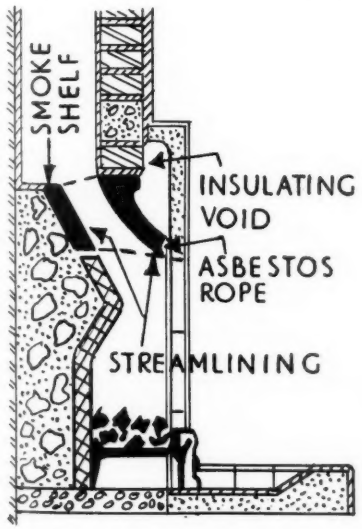


Fig. 3: Section of fireplace showing use of the Finch preformed chimney throat unit

New Ideal Boilers

The words 'Ideal boiler' have passed into popular speech as meaning any independent domestic boiler, a fact which may not be to the liking of boiler makers other than the National Radiator Company, but which says much for the performance of the latter's products. A new range of designs of Ideal boilers can therefore be regarded as news. The general form (Fig. 4) is clean and rectangular, and the colours cream and black or grey mottle and black. There are three sizes: 0-XLB, giving 20,000 B.T.U. per hour; 1-XLB, giving 25,000 B.T.U. per hour; and 2-XLB, giving 40,000 B.T.U. per hour. The design is not merely a restyling, but contains several new features. The doors have machined faces and jamming handles (which are insulated) so that air leaks round the edges are prevented. There is a rocking grate designed to avoid that vice of shaking grates—jamming with small pieces of clinker. The ash-pan is of exceptional depth and shaped to keep the cavity in which it sits clear of ash. The damper is of butterfly type controlled by a loose handle, and there is a double concentric boiling ring and filler hole on top. A specially good feature is a sloping lip at the bottom of the fire bars so that when the upper door is opened any loose ash which falls through the bars is caught and slides back into the boiler and not out on to the hearth. Those of us who daily operate our household boilers will appreciate these refinements. The prices of the three models range from £12 19*s.* 6*d.* to £29 10*s.* 9*d.* plus a few minor extras.

Bitumetal roofing

This system of roofing comprises a composite roof built up from aluminium decking, insulation board, and bitumen covering, and can be adapted to flat, pitched, curved, or vertical construction. The aluminium structure is in trough form, the channels being 2½ in. high at 6 in. centres. Over this troughing ½ in. insulation boarding is laid, covered with a bitumen surface which can be given an application of stone chippings if desired. The troughing is fixed direct to the purlins. Bitumetal roofing was originally made in 18 gauge aluminium, but experience showed that for many types of building this gauge was stronger than necessary, and the roofing can now be had in 20 gauge, with, of course, a reduction in price though still capable of sustaining the generally accepted loading. In both gauges the complete roof weighs from 4 to 7 lb. per sq. ft. Bitumetal is supplied by William Briggs and Sons Ltd., of East Camperdown Street, Dundee, and Vauxhall Grove, London, S.W.8.

Fig. 4: The new design of 'Ideal' domestic boiler by the National Radiator Company

Nuralite roofing material

Anything that promises to avoid the use of metal in roofing work deserves attention these days. Messrs. Cellactite and British Uralite Ltd. have produced a material, Nuralite, which can be used for roofing, ridging, flashing, guttering and the like. Nuralite is based on asbestos and bitumen, and is built up of closely-knit laminations hydraulically compressed to a dense rubber-like substance, which is supplied in sheets 8 ft. by 3 ft. When new, Nuralite is mottled black in colour, but weathers to a light grey. The weight of the sheet is about 12 lb.

When warmed with a blow-lamp, Nuralite becomes flexible enough to be adapted to the desired shape, and on cooling it recovers its rigidity and keeps its shape. Joints can be welded by dividing the laminations of one sheet and inserting the edge of the next sheet; sealing being done with a bituminous mastic specially supplied for the purpose. The sole distributors are Messrs. Henry Honess and Son, 39 Windmill Street, Gravesend, Kent.

(To be continued)

Practice Notes

Edited by Charles Woodward [*A*]

IN PARLIAMENT. Ministry (Change of Name). Asked why the name of the Ministry of Local Government and Planning has been changed to Housing and Local Government, the Prime Minister replied: The change has been made in order to emphasise the importance of housing. The word 'Planning' has been omitted from the Minister's title for reasons of brevity and not of policy. (12 November 1951.)

NOTE. An Order, S.I. 1951, No. 1900, Ministers of the Crown (Transfer of Functions), changes the style and title of the Minister of Local Government and Planning to 'The Minister of Housing and Local Government' as from 3 November 1951. The new style and title is substituted for the former style and title in all enactments relating to the said Minister, and in all instruments, contracts and legal proceedings made or commenced before the coming into operation of the Order which refer to the said Minister.

MINISTRY OF HOUSING AND LOCAL GOVERNMENT. Flues of the Unity House. Circular 65/51, dated 14 November 1951, refers to the fire hazards arising from the cased-in flues in certain Unity type houses. There appears to be no doubt that there is an excessive risk of fire from the boiler flue and that there is no suitable remedy with the asbestos or iron pipe in the present position. It is recommended that in these houses the use of the existing boiler flue should be discontinued, the alternatives being to use an immersion heater or to construct an outside flue to the existing solid fuel appliance. In the Minister's view the second alternative is clearly the one to adopt, and he suggests that all local authorities who have built this type of house should give consideration to this as a matter of urgency.

No similar degree of risk appears up to now to have come from the living room flue, which is, however, still the subject of further investigation.

Building Bye-laws. Circular 67/51, dated 23 November 1951, states that it has become necessary to postpone again the date on which existing bye-laws would have lapsed, and the Building Bye-laws (Extension) Order 1951 allows bye-laws now operative to remain in force until 31 December 1952.

New House Designs. 1952 Programme. Circular 70/51, dated 27 November 1951, addressed to all Housing Authorities, states that to help local authorities to build as many houses as possible with the available resources, several specimen designs have been prepared of houses with rooms and living space fully up to present Manual standards but with a superficial area of less than 900 sq. ft. for a three-bedroom house for five persons and 750 sq. ft. for a two-bedroom house. The specimen designs will be published in a Supplement to the 1949 Housing Manual, which will be circulated to local authorities as soon as it can be printed. Pending the receipt of the Supplement, photostat copies of any of the designs will be supplied on application to the Principal Regional Officer if this would enable the authority to proceed without waiting for the Supplement. Houses to these new designs take less materials and are cheaper to build than the types which have usually been built by local authorities in recent years. Lower capital costs should be reflected in lower rents.

If houses to the new designs are completed more quickly and the authority are able to build more houses than the number allocated to them for 1952, the Minister will, later in the year, be prepared to make them an additional allocation.

An appendix to the Circular gives brief descriptions of specimen designs for houses with present standards of rooms and living space but with smaller total superficial areas. There are 21 types, some of which include whole house heating. This form of heating installation is higher in initial cost but not in running cost, and the availability of boiler fuel in the area must be taken into account in considering the adoption of these designs.

Houses for Owner Occupiers built under licence. Circular 73/51, dated 27 November 1951, states that the Minister has had under review the general housing position and the execution of the housing programme, and he considers that there should be three main objectives :

(1) The maintenance of an adequate supply of houses available for letting to families in need of houses.

(2) A greater discretion to individual local authorities to meet the varied needs of different districts.

(3) The encouragement of house ownership for those who wish to acquire their own homes.

The allocation of houses to be built by local authorities and those to be built under licence can to a large extent be left to each local authority in the light of their knowledge of the needs of the district. It should now be open to each local authority to issue licences up to a maximum of one-half of their 1952 allocation. Arrangements for the following year will be reviewed, having regard to the experience of the first year's working.

The Minister understands that in some districts the building of houses under licence has been hampered by difficulties in obtaining land. Under section 73 (*c*) of the Housing Act 1936, as amended by section 1 of and the First Schedule to the Housing Act 1949, local authorities have power to acquire land for lease or sale for the building of houses by persons other than the local authority. The Minister will be prepared to consider applications for sanctions to loans for this purpose when the local authority are satisfied that this action is necessary in order to provide houses for persons in need of homes.

House ownership can be encouraged by local authorities if they use the powers given to them under the Small Dwellings Acquisition Acts and the Housing Acts for this purpose. The Minister hopes that all local authorities will give sympathetic consideration to applications made to them by persons who desire to build or acquire their own houses, and he will be ready to sanction loans to enable local authorities to exercise their statutory powers.

Local authorities have also power to sell houses which they have themselves built under the Housing Acts. The Minister will be prepared to consider applications from local authorities for permission to sell houses, and the procedure to be adopted in making such applications will be sent to the local authorities in the near future.

An Appendix to this Circular 73/51 *sets out the conditions which it is suggested should be taken into account by local authorities in the issue of licences, and they are as follows;*

Houses may be built under licence either for letting or for sale. When built for letting the actual persons who are to occupy the houses will not be known in advance though it will usually be possible to ascertain for what kind of worker the house is intended. When houses are to be built for sale, licences should not be issued in respect of houses for sale to unknown purchasers. Houses built under licence must go and be seen to go to persons with a housing need comparable to that served by houses built by the authority.

Each licence should relate to not more than one structurally separate building, e.g. a single house or a pair of semi-detached houses. In suitable cases a number of licences can be issued to a single builder building a number of houses for approved occupiers.

The plans and outline specification should be approved by the local authority. The general specification and the amount of supervision exercised should be equivalent to that laid down in the scheme operated by the National Housebuilders Registration Council (82 New Cavendish Street, London, W.1).

The use of scarce materials should not be permitted to a greater extent than that adopted by the authority in their own houses, size for size. The use of more expensive substitutes and for the fittings generally used should be encouraged.

The maximum superficial area of a house built under licence should be 1,500 sq. ft. The local authority, in determining the size and type of house, should have regard to the size and composition of the family for whom it is intended.

Appropriate administrative action should be taken to ensure that work to houses for which licences are issued can be started within a reasonable period. The condition that construction must be started within two months of the date of issue of the licence is cancelled.

The issue of licences available should be spread over the relative period so as to avoid dislocation of the local building programme.

By mutual agreement between local authorities, an application from a person living in one district who desires to move and build a house in another district for his own occupation may be dealt with. The licence may be issued by the authority in whose area the house is to be built and is chargeable against the quota of the authority for the district in which the applicant at present lives. Such arrangements do not require the approval of the Department.

Every house built under licence must be subject to a limit of *building* cost, and to a condition prescribing the maximum selling price and rent chargeable.

The figure included in the licence itself is the amount of expenditure authorised to be incurred by the person to whom the licence is issued. In determining this figure the local authority should have regard to the cost of building council houses in the district, with suitable allowance for differences in size, special circumstances arising out of the cost of building on particular sites, e.g. building in stone or when the cost of the land or its development is abnormal, the specification to which the house is proposed to be built, or for any other differences in conditions which are relevant.

Encouragement should be given to the use of alternative materials to those known to be scarce and to the use of alternative fittings and equipment. The additional cost which may be involved should be taken into account in fixing the amount of the licence.

It may be proper and desirable to issue a supplementary licence to cover unavoidable additional expenditure during the building of the house, e.g. there may be rises in the ruling rates of wages and materials, or it may be found necessary or desirable to substitute more expensive materials or equipment. Supplementary licences should be sought and issued before the works are completed, and the authority should take such appropriate action as they can to deal with this matter.

The approved maximum sale price is to be determined by the authority and should represent what in their opinion is the fair price for the completed house based on the cost of building, land, development and other costs incidental to building a house. When a supplementary licence is issued the Minister is advised that it is competent for the authority to reassess and restate the maximum selling price on the supplementary licence; a corresponding entry should be made in the Land Charges Register.

Under section 43 (1) of the Housing Act 1949 a house built under licence may not be sold or let above the permitted maximums, and this prohibition extends at present to 20 December 1953. Under section 43 (5) of the Act the local authority can increase the maximum selling price and rent where duly authorised work has been carried out after the completion of a house the subject of a licence.

Steel Authorisation. Following the announcement by the Ministry of Works, published on page 479 of the October JOURNAL, regarding the method of obtaining authorisation for steel, the following Circular No. 71/51 has been addressed to Local Authorities by the Ministry of Housing and Local Government.

Sir,

Steel Distribution Scheme

1. I am directed by the Minister of Housing and Local Government to refer to Circular 59/51 of 26 September 1951 on the subject of the Distribution Scheme for certain forms of non-alloy steel. As was announced by the Minister of Supply in the House of Commons on 12 November 1951, the Government have decided that the operation of this Scheme should be postponed until 4 February 1952. The necessary Statutory Order will be made as soon as possible.

2. The particulars referred to in paragraph 2 of Circular 59/51 should now include the weight of steel contained in orders with suppliers which can not be delivered by 4 February 1952. A separate return, on the basis of the form attached to Circular 59/51 should, as requested, be completed for each job and forwarded as soon as possible either to the Principal Regional Officer or to the Department's Principal Priority Officer, as explained in paragraph 3 of that Circular. The forms should be prepared by the local authorities themselves. Item 6 of the form should now read as in Table 1 below.

3. As regards paragraph 5 of Circular 59/51, the Authorising Symbol at the top of the I.S. Authorisation Form for work carried out by a local authority will now be 'H.E.D./H.L.G.'.

Ministry of Housing
and Local Government.

MINISTRY OF EDUCATION. Primary School Building. The Ministry have now published Building Bulletin No. 6 (H.M. Stationery Office, price 2*s.* 6*d.* net). The Bulletin includes plans of 20 new primary schools with a commentary on each one, selected to illustrate different solutions to the problem of planning various types and sizes of such schools. Administrative rooms are now generally sited centrally and not in a separate wing. The old idea of the head teacher's room being a forbidden sanctum is vanishing as a result of the freer treatment of the administrative wing. Such rooms are mostly adjacent to the entrance hall, readily accessible to visitors and within easy reach of all class spaces. School entrances are no longer kept exclusively for ceremonial purposes. Children, staff and visitors alike use them, and they are generally used as a waiting area for visitors, including parents, who are thus able to get a better picture of the life of the school than if confined to a separate room.

MINISTRY OF WORKS. Plastering on Building Boards. The Ministry have now issued Advisory Leaflet No. 21, entitled 'Plastering on Plasterboard and Insulating Fibre Building Board'. It is obtainable at H.M. Stationery Office, price 3*d.* The leaflet indicates the precautions to take in mixing and applying plaster so as to avoid rippled surfaces, falling plaster, cracking and popping.

Incentive Schemes in the Building Industry. A new survey, dated June 1951, of incentive schemes in England and Wales has been issued by the Ministry. Returns from 31,564 building sites covering 347,319 operatives show that 28 per cent of the sites had incentive schemes for 41 per cent of the main contractor's labour. In Scotland the figures are sites 11 per cent, men 12 per cent.

On housing work as a whole in England and Wales, schemes were operated on 31 per cent of the sites and for 44 per cent of the men. On housing sites of upwards of £10,000 in value (on which two-thirds of the housing labour force was employed) the proportion of sites operating schemes was 49 per cent, covering 53 per cent of the men.

Of the sites engaged on maintenance and repair, 24 per cent claimed to be operating schemes based on output, covering 26 per cent of the total men engaged on this work.

The types of work covered by the survey include new housing, schools, factories, power stations, public buildings, shops and commercial premises and agricultural buildings.

TABLE 1

(*See Form attached to Ministry of Housing and Local Government Circular* 59/51, *Item* 6)

Steel Requirements (in Tons)

	TOTAL	Delivered or to be delivered by 4 Feb., 1952	REQUIRED FOR DELIVERY AFTER 4 FEBRUARY 1952			
			In Period 4 Feb., 1952 to 31 March, 1952	In Period II 1952 (April-June)	In Period III 1952 (July-Sept.)	Subsequently
Reinforcing rod & mesh						
Other controlled steel						

HOLIDAYS WITH PAY AND PUBLIC HOLIDAYS. Amendments have been made to the agreement for providing holidays with pay and payment for public holidays in the building industry. As from 7 April 1952 each operative is to be credited by the employer in respect of holidays with pay with the sum of two shillings and ninepence, except in the case of persons (male or female) under the age of 18 years, when the sum is to be two shillings and threepence. As from 14 April 1952 each operative is to be credited by the employer in respect of public holidays with the sum of two shillings and ninepence, except in the case of operatives (male or female) under the age of 18 years, when the sum is to be two shillings and threepence.

The amendments are dated 19 September 1951.

NATIONAL SCHEDULE OF DAYWORK CHARGES. It has been agreed between the N.F.B.T.E. and the R.I.C.S. that the charge for the use of painters' brushes shall be increased as from 30 November from 2*d.* to 3*d.* per hour on the wages of working foremen painters, painters, painters' labourers and apprentices. Paragraph (*h*) of Schedule C on page 6 of the National Schedule of Daywork Charges dated 1 June 1950 should be altered accordingly. (Press Notice dated 30 November 1951.)

The War Damage Commission have agreed to the increase and paragraph 30 (*e*) of R.O.D.I. will be amended accordingly as from 15 October 1951.

LAW CASE. Sunlight to Greenhouse. At Bridlington County Court on 17 September an action was brought against a firm of builders who constructed a wall which shut out the rays of the sun from a greenhouse erected in the garden of the plaintiff's house, causing her to abandon the culture of tomatoes.

The Court held that the greenhouse was entitled to access to the sun to the same unobstructed extent as it had previously enjoyed, in order to ripen such tomatoes as might be growing there, and awarded the plaintiff damages amounting to £150, plus costs. (THE ESTATES GAZETTE, 29 September 1951.)

The Trustees of Mrs. Amelia Mary Birts and the Central Land Board. This is the first appeal against a determination by the Central Land Board of development value under Part VI of the Town and Country Planning Act 1947, and the following report of the Lands Tribunal's decision is reproduced here by the courtesy of the Public Relations Officer of the Board.

DECISION

'This is an appeal against a determination of the Central Land Board made in pursuance of the Claims for Depreciation of Land Values Regulations 1948 (S.I. No. 902) on 30 November 1950 that there is no development value in the freehold interest in a number of houses situated at Bromley in Kent.

'The property comprises 14 dwelling-houses and two shops in three terraces: 104/110 Burnt Ash Lane, 112/122 Burnt Ash Lane, 124/130 Burnt Ash Lane, and a pair of semi-detached houses 2 and 4 Hilldrop Road, all situated at Bromley, Kent. Nos. 110 and 112 Burnt Ash Lane are shops. These houses are held on two 99-year leases from 25 March 1905 at an aggregate ground rent of £80 a year. The Appellants are the owners of the freehold interest in these houses, which have 56 years still to run.

'Mr. Arthur Richmond Craig Hall, who appeared for the Appellants, put in the following claim:—

'For (1) Unrestricted Value and for (2) Restricted Value as shown in Tables 2 and 2a, and for (3) Development Value.

'NOTE.—*In "restricted value" the shop sites valued at £35 per foot frontage include an allowance in respect of Third Schedule tolerance.*

'The Board's estimate of the restricted value is the same as that of the unrestricted.

'The difference of £486 found by Mr. Craig Hall arises in two ways: First he adopts a 4½ per cent discount rate in the calculations of the restricted value of the immediate income as against 4 per cent in the calculation of the unrestricted. Secondly he assumes that planning permission would not be given for the conversion of the dwelling-house into shops on the reversion of the lease, thereby diminishing the value of the reversionary interest.

'He justifies the higher rate of interest on the ground that in his opinion the security for the ground rents is diminished. Now whether in fact this view is correct is immaterial because it seems to us that he is precluded by Section 62 (2) from taking it into account. That section provides that the computation must be based on the assumption that the lessee will at all times be able to pay the rent and perform his other obligations under the lease. This in effect amounts to an assumption that the security for the ground rents will not be affected.

'There is more substance in Mr. Craig Hall's second point that the value of the reversionary interest would be diminished by refusal of planning permission to convert the houses into shops. In this case, however, we think the point is merely academic. We turn to Section 62 (1) which provides that rules (2), (3) and (4) of the Rules set out in Section II of the Acquisition of Land (Assessment of Compensation) Act 1919 shall apply in computing the restricted and unrestricted values of interests in land. Rule (2) of these Rules is as follows:—

' "The value of land shall be taken to be the amount which the land if sold in the open market by a willing seller might be expected to realise.' "

'This is a sale of well secured ground rents, and in our opinion the open market would have little or no regard to a reversion deferred for 56 years. We think it highly unlikely in any event that a purchaser would be influenced by the comparatively insignificant difference between reversionary value of the existing houses and the reversionary redevelopment value with neither of which he would be concerned for another 56 years.

'We emphasise that we are dealing with the particular facts of this case only; we do not wish our decision to be taken as an authority for the proposition that depreciation of the reversionary interest in ground rents should never be taken into account in deciding cases brought under Part VI of the Act.

'We therefore confirm the determination of the Central Land Board that there is no development value in the freehold interest in the property the subject of this appeal.

'Costs are awarded to the Central Land Board on County Court Scale No. 3, such costs to be agreed or taxed.

'Dated the 24th day of October, 1951.

(*Signed*) W. J. FITZGERALD
CECIL H. BAILEY'

Table 2. Unrestricted Value

	Income	£80	£	£
(*a*) Years' purchase for period 1.7.48 to 25.3.2004. at 4 per cent	56 years	22·20	1,776	
(*b*) Reversion to site for erection of shops on Burnt Ash Lane frontage and dwellings on Hilldrop Road frontage, or alternatively for commercial or business premises:				
Burnt Ash Lane, 223 ft. 4 in. at £35 per foot frontage		£7,816		
Hilldrop Road, 32 ft. 5 in. at £6 per foot frontage		195		
		8,011		
Present Value of £1 receivable in 56 years at 5 per cent		·0651	522	2,298

Table 2a. Restricted Value

	Income	£80	£	£
(*a*) Years' purchase for 56 years at 4½ per cent		20·33	1,626	
(*b*) Reversion to site for erection of two shops and the remainder as dwelling-houses:				
(i) Existing shop frontage Nos. 110 and 112 Burnt Ash Lane, 32 ft. 4 in. at £35 per foot frontage		£1,132		
(ii) Burnt Ash Lane, frontage for dwellings, 191 ft. 0 in. at £8 per foot frontage		1,528		
(iii) Hilldrop Road for dwellings, 32 ft. 5 in. at £6 per foot frontage		195		
		2,855		
Present value of £1 receivable in 56 years at 5 per cent		·0651	186	1,812
				£486

Notes and Notices

NOTICES

Third General Meeting, Tuesday 8 January 1952 at 6 p.m.

The Third General Meeting of the Session 1951-52 will be held on Tuesday 8 January 1952 at 6 p.m. for the following purposes:

To read the Minutes of the Second General Meeting held on 11 December 1951; formally to admit new members attending for the first time since their election.

To read the Council's Deed of Award of Prizes and Studentships 1952.

Mr. Frederick Gibberd, M.T.P.I. [*F*], to read a paper on 'Expression in Modern Architecture'.

(Light refreshments will be provided before the meeting.)

Session 1951-52, Minutes 1

At the Inaugural General Meeting of the Session 1951-52, held on Tuesday 6 November 1951 at 6 p.m.

Mr. A. Graham Henderson, A.R.S.A., President, in the Chair.

The meeting was attended by about 150 members and guests.

The Minutes of the Ninth General Meeting of the Session 1950-51, held on Tuesday 19 June 1951, having been published in the JOURNAL, were taken as read, confirmed and signed as correct.

The President delivered his Inaugural Address of the Session.

On the motion of the Right Hon. David Eccles, M.P., Minister of Works, seconded by Sir Stephen Tallents, K.C.M.G., C.B., C.B.E. [*Hon. A*], a vote of thanks was passed to the President by acclamation, and was briefly responded to.

The President presented the R.I.B.A. London Architecture Bronze Medal and Diploma for 1950 to Messrs A. J. P. Powell and J. H. Moya [*A*/*A*] for the Westminster City Council's Housing Scheme at Pimlico. Messrs. Powell and Moya briefly thanked the President and Council for the honour conferred upon them.

The President also presented the replica of the Bronze Medal to Mr. Alderman C. P. Russell, J.P., Leader of the Council of the City of Westminster (past Chairman of the Housing Committee), representing the building owners, and he and Mr. Ernest C. Holloway, representing the Contractors for the Scheme, also spoke.

The President then presented the R.I.B.A. Architecture Bronze Medal and Diploma for New South Wales for 1947 to Mr. Brian O'Rorke, A.R.A. [*F*], for the Orient Line Building, Sydney, designed in association with Messrs. Fowell, McConnel and Mansfield [*F*/*F*]. Mr. O'Rorke briefly thanked the President and Council for the honour conferred upon him.

The proceedings closed at 7.35 p.m.

Elections Void

Under the provisions of Bye-law 17, the following elections have been declared void:

AS ASSOCIATES

Mr. Jeffrey William Hamilton-Howlett.
Mr. Anthony Fox Laity.
Mr. Devanahalli Venkanna Raghavendra Rao.

AS LICENTIATE

Mr. Zalik Jacobson.

R.I.B.A. Kalendar—Mr. P. D. Windle [*A*]

A correction concerning Mr. Windle's address given in the 1951-52 Kalendar appeared in the October issue of the JOURNAL, on p. 483. It should now be noted that Mr. Windle's telephone number has been changed by the G.P.O. to Idle 975.

British Architects' Conference 1952

The British Architects' Conference next year will be held in Edinburgh from 25 to 28 June at the invitation of the Royal Incorporation of Architects in Scotland.

In view of the great demand on hotel accommodation in Edinburgh, members who intend to be present at the Conference should make their reservations at the earliest possible moment and in any case not later than January 1952. *The bookings must be made through the Secretary, R.I.A.S., 15 Rutland Square, Edinburgh, 1*, and members should communicate with him, giving details and the hotel at which they desire to stay, together with second and third preferences.

The Conference Committee have arranged provisional bookings as shown in the following table:

British Architects' Conference, Edinburgh, 25 to 28 June. Hotel accommodation provisionally booked

HOTELS	ROOMS			TARIFF	
	Double beds	Twin beds	Single beds	Bed and breakfast (each)	Bed, breakfast and dinner (each)
(*a*) Braid Hills Hotel	2	—	4	—	32/6
(*b*) Bruntsfield Hotel	5	10	10	21/–	30/–
Caledonian Hotel	5	5	10	35/–	—
do. with private bathrooms	5	5	—	42/6	—
Cockburn Hotel	4	4	8	17/6	26/–
Dean Hotel	2	5	2	17/6	25/–
George Hotel	8	15	10	25/–	—
(*c*) Green's Hotel	2	10	4	17/6	—
(*d*) Iona Private Hotel	1	4	3	20/–	26/–
Maitland Hotel	6	4	2	—	31/–
North British Hotel	20	20	20	28/6	—
Pirie's Hotel	4	8	1	12/6	17/6
Queen's Hotel	—	4	2	21/–	27/–
Roxburghe Hotel	2	6	4	23/6	31/–
Royal British Hotel	5	5	—	21/–	—
Royal Circus Hotel	—	8	—	15/6	20/6
Rutland Hotel	1	5	1	18/6	24/–
St. Andrew Hotel	6	6	3	18/–	—

NOTE:

(1) It will be appreciated that the foregoing prices are minimum prices, which may be increased by the time of the Conference.

(2) All these hotels are within ten minutes, either walking or tramcar, from the Conference Headquarters, with the exception of (*a*) which is 20 minutes by tramcar, (*b*), (*c*) and (*d*) which are 15 minutes by tramcar.

(3) Members desiring to take up rooms are requested to communicate with the Secretary, Royal Incorporation of Architects in Scotland, 15 Rutland Square, Edinburgh, 1 as soon as possible, indicating which hotel they desire, with second and third preferences.

R.I.B.A. Dinner

The R.I.B.A. Dinner in 1947 was held in the Henry Florence Hall, and owing to the limited accommodation it was unfortunately necessary to refuse tickets for a considerable number of members and their guests. The Council have decided to hold a Dinner in 1952, and in order to ensure that no members will be disappointed it will be held at Grosvenor House, Park Lane, London, W.1, on Thursday 20 March 1952. The cost of the tickets is 32*s*. 6*d*. each, exclusive of wines, cigars, etc. Evening dress will be worn.

A form of application is enclosed with this issue of the JOURNAL, and members are asked to send in their applications, accompanied by the necessary remittance, at the earliest possible moment.

COMPETITION

City of London (Golden Lane) Housing Scheme

The Corporation of London invites architects to submit designs in competition for a new housing scheme in Golden Lane, E.C.

Assessor: Mr. Donald H. McMorran [*F*].

Premiums: 1,000 gns., 700 gns., 500 gns., 300 gns.

Last day for submitting designs: 31 January 1952.

Conditions may be obtained on application to the Town Clerk, Corporation of London, 55-61 Moorgate, E.C.2.

Deposit 2 gns.

COMPETITION RESULT

Technical College, Poole

1. Mr. Enrico de Pierro, B.Arch. (McGill).
2. Mr. T. C. Ralph [*A*] and Mr. H. J. Gordon [*A*].
3. Mr. S. C. Halbritter [*A*].

Commended

Messrs. Johns and Slater [*F*/*A*].
Messrs. Frederick Lawrence and Partners [*A*/*A*].

ALLIED SOCIETIES

Changes of Officers and Addresses

Royal Incorporation of Architects in Scotland: Secretary and Treasurer, Mr. K. Macrae, W.S.

The Royal Institute of the Architects of Ireland: President (as from 1 January 1952), Mr. Eoghan D. Buckley, B.Arch., F.R.I.A.I., 21 Merrion Square, Dublin.

Essex, Cambridge and Hertfordshire Society of Architects, Colchester and District Chapter: Hon. Secretary, Mr. R. A. W. Orrin, 48 Wimpole Road, Colchester.

Devon and Cornwall Architectural Society: Dinner and Ball

Mr. J. Ardern Powell, M.A. [*F*], President of the Devon and Cornwall Architectural Society, presided at the Fifteenth Annual Dinner and Ball of the Society held at Torquay on Friday 26 October 1951, at which Mr. A. Graham Henderson, A.R.S.A., President, R.I.B.A., was the guest of honour. The President was accompanied by Mrs. Henderson and the Secretary of the R.I.B.A., Mr. C. D. Spragg, C.B.E.

Replying to the toast of the R.I.B.A., which was proposed by the Mayor of Torquay, Alderman E. G. Ely, J.P., Mr. Henderson said that from a financial point of view members of the Society might perhaps be not so fortunately situated as those practising in a more industrial area. Housing work, although essential and important, was not very remunerative.

In proposing the toast of the Society, Mr. G. G. Dingle, F.R.I.C.S., said he hoped

present-day architects would be able to evolve a style to mark the present times as clearly as different periods had been marked architecturally in the past. Mr. Powell responded.

The toast of the Guests was proposed by Mr. L. F. Vanstone [*L*], and Mr. J. A. Wetherell replied.

There were 115 members and guests present, many of whom had travelled from the far side of the counties.

Liverpool Architectural Society : Annual Dinner

The Liverpool Architectural Society's Annual Dinner was held at the Adelphi Hotel on 16 November and attended by over 130 members and guests. The President of the R.I.B.A. was unable to attend, but was represented by the Vice-President, Mr. Norval R. Paxton, M.C. [*F*], accompanied by Mrs. Paxton, and Mr. W. R. F. Ellis, O.B.E., T.D., Deputy Secretary, R.I.B.A.

After proposing the 'Loyal Toast', the President, Mr. F. J. M. Ormrod [*F*], called upon the first speaker, Mr. F. C. Saxon, M.C. [*F*], to propose the 'Toast of the City of Liverpool'. This was replied to by the Lord Mayor of Liverpool, Alderman Vere E. Cotton, C.B.E., T.D. Alderman Cotton is an Hon. Fellow of the L.A.S. and recently opened the new premises of the Society in the rebuilt section of the Bluecoat Chambers. The toast of the 'Liverpool Architectural Society' was proposed by the Vice-President of the R.I.B.A. and was replied to by the President of the L.A.S.

The last toast of the evening, 'The Guests', was proposed by Mr. L. W. M. Alexander [*A*], and was replied to by the President of the Liverpool Regional Federation of Building Trades Employers, Alderman W. T. Lancashire, J.P.

Nottingham, Derby and Lincoln Architectural Society: Annual Dinner

The Annual Dinner of the Nottingham, Derby and Lincoln Architectural Society was held at the Black Boy Hotel, Nottingham, on 2 November. Mr. T. N. Cartwright, D.S.C. [*F*], President of the Society, presided and proposed the toast of the cities of Nottingham, Derby and Lincoln. Mr. Cartwright expressed the view that the quality of Nottingham housing had fallen as compared with that of Derby and Lincoln. He was hopeful that the change of Government would mean more freedom for the building industry, but not that the worst type of speculating builder would be free to build inferior houses.

The toast was replied to by the Lord Mayor of Nottingham, Alderman G. H. Wigman, J.P., the Mayor of Derby, Councillor Z. P. Grayson, J.P., and the Mayor of Lincoln, Councillor T. F. Taylor, J.P. The Lord Mayor of Nottingham in his speech said that he too was disappointed with the type of houses which was being erected at the present time in Nottingham.

The toast of the R.I.B.A. and Allied Societies was proposed by the Sheriff of Nottingham, Councillor S. Hobson. In his reply the President of the R.I.B.A., Mr. A. Graham Henderson, A.R.S.A., doubted whether the change of Government would make any very substantial difference to architects. Mr. W. Caparne Baldry (*L*), Vice-President of the Society, proposed the toast of the guests, which was replied to by Mr. C. D. Spragg, C.B.E., Secretary of the Royal Institute.

Hampshire and Isle of Wight Architectural Association: Annual Outing

The Association's annual outing was, owing to circumstances, fixed rather late this year; but in October some 45 members enjoyed a pleasant and instructive visit to Wilton House, Salisbury, the seat of the Earl of Pembroke and Montgomery. In excellent weather members were conducted round the house and grounds, and tea was then taken at the Pembroke Arms, Wilton. After tea visits were paid to several of the interesting and historic buildings in the old town, and dinner and a convivial evening at the Red Lion Hotel, Salisbury, wound up the day's proceedings.

GENERAL NOTES

Course on the Protection and Repair of Ancient Buildings

The Academic Development Committee of York Civic Trust announce that a two-week residential course on the Protection and Repair of Ancient Buildings will be held at York from 8 to 20 September 1952. It will be under the direction of Dr. W. A. Singleton, M.A., B.Arch., Dip.T.P., [*A*], of the University of Manchester, and will be intended primarily for practising architects, surveyors, builders and others whose work requires specialised knowledge in this field.

Lectures will be given on the following aspects of protection and repair: status of architects and consultants, and their relationship with the various types of public and private owner; building techniques employed from Saxon times till the early 19th century; methods of survey; maintenance and repair work; problems met with in individual crafts such as masonry, brickwork, etc.; geological consideration of sites; services; relations with official and consultative bodies; bibliography of suitable books, films, drawings, etc.; and contracting and costing for repair work. Practical study will occupy a third of the time spent on the course. Visits will be arranged to sites in or near York.

The course will provide for a maximum of 20 students. A detailed syllabus will be available in March 1952. Enquiries should be made to The Secretary, Academic Development Committee, York Civic Trust, 1 Museum Street, York.

Maintenance Scholarships in Architecture

The Architects' Registration Council of the United Kingdom offer for award in June 1952 certain Maintenance Scholarships in Architecture. The Scholarships will consist of a grant for the payment of one-third of the School fees and, when necessary, a maintenance allowance. The Scholarships will be renewable from year to year until the student has finished his or her School training. They will be available for students of British nationality who could not otherwise afford such training to enable them to attend Architectural Schools approved by the Council. The Scholarships will be available both for students who have already begun their training and for students wishing to begin their training. Scholarships will not be granted to students who will be less than 17 years of age on 1 October of the year in which the examination is taken.

Particulars and forms of application may be obtained from the Secretary to the Board of Architectural Education, Architects' Registration Council of the United Kingdom, 68 Portland Place, London, W.1. Copies of previous years' examination papers may be obtained on payment of 6*d*. The closing date for the receipt of applications, duly completed, is 31 January 1952.

Town Planning Joint Examination Board

The Examiners wish to make known to candidates the following notes of advice on Testimonies of Study, General and Special, in Part I of the 1951 Final Examination:

(*a*) The candidate should state clearly on the first page of his Report the main objective of his scheme (e.g. new town, town expansion, preservation of historic character, new industrial development, etc.) and the main assumptions about the rate of and the resources for development.

(*b*) The candidate should state, in the event of there being an existing scheme for the area he has chosen, whether he is accepting and developing it, or is revising it in essential respects, or is ignoring it entirely.

(*c*) The candidate should acknowledge sources of survey material and indicate which summaries or analyses are his original work.

(*d*) The candidate should weigh carefully what maps or diagrams are best suited to illustrate the conclusions leading up to his plan. He is reminded that the syllabus does not require necessarily the same or all the material which may be proper under an Act of Parliament; he may sometimes find it possible to show in a single analytical diagram the conclusions to be drawn from a series of surveys.

(*e*) The candidate should indicate, either by diagram or plan, the surroundings of the area he has studied. This should show the main road pattern and other important features of the area in which he has studied a whole town or rural area, or the whole town in which he has studied a town centre or neighbourhood in detail.

(*f*) The candidate should keep the scale, number and size of maps to the minimum consistent with clarity of expression. Current practice* in notation methods should not be slavishly followed but applied in such a manner as to bring out the candidate's proposals clearly and with sympathy to the problem. For example, the type of important road junctions should be evident and road widths not greatly exaggerated on 6-in. scale maps; road widenings should be drawn to scale and correct position when 1/2,500 scale maps are used, and typical building plots, etc. indicated. It is almost always an advantage to use colour to make the form of the plan clear.

(*g*) The candidate is reminded that the syllabus requires the expression of design in a plan. The character of design depends in large degree on the main objective of the scheme: it should be reflected in part by the plan of proposed land uses and also by studies indicating building height, lay-out, etc.

(*h*) The candidate should limit his report to setting out the nature and magnitude of the problems emerging from the analysis of survey and should avoid long topographical descriptions, photographs, etc.

Journal: Bound Copies

The fifty-eighth volume of the 3rd series of the R.I.B.A. JOURNAL was completed with the October issue. It will be possible to provide a limited number of bound volumes as in previous years, and these should be available early in April 1952. Loose numbers of the volume must be returned in exchange for bound volumes. Orders should be addressed to the Secretary, R.I.B.A. The styles are as follows:

Bound in paper sides, strong linen back, 7*s*. 6*d*. plus 11*d*. postage.

Bound in buckram boards, gilt lettering, 12*s*. 6*d*. plus 1*s*. 1*d*. postage.

Buckram binding cases, 6*s*., plus 6*d*. postage.

Correction

In the obituary of Mr. Arthur Joseph Davis, R.A. [*F*], in the November JOURNAL, it was stated that Mr. Davis was awarded the London Architecture Bronze Medal in 1930 for the Westminster Bank in Lothbury. In fact, Mr. Davis was awarded this medal for the Westminster Bank in Threadneedle Street, London, E.C.

* See Ministry of Town and Country Planning Circular No. 92. H.M.S.O. 1951. Price 4*s*. 6*d*.

Notes from the Minutes of the Council

MEETING HELD ON 6 NOVEMBER 1951

Appointments

(A) R.I.B.A. Representatives on Ministry of Works Building and Civil Engineering Regional Joint Committees: The Secretary reported that the following nominations for the year 1952 made by the President had been approved by the Minister of Works:

Northern, Lieut.-Colonel A. K. Tasker, T.D. [*F*]; *East and West Ridings of Yorkshire*, Mr. Norval R. Paxton, M.C. [*F*]; *North Midlands*, Mr. C. F. W. Haseldine, T.D. [*F*]; *Eastern*, Mr. Peter Bicknell [*F*]; *London*, Mr. R. H. Sheppard [*F*]; *Southern*, Mr. T. L. J. Chamberlain [*F*]; *South Western*, Mr. J. Ralph Edwards, A.R.W.A., F.S.A. [*F*]; *Wales*, Mr. John Bishop [*A*]; *Midlands*, Mr. J. B. Surman [*F*]; *North Western*, Mr. E. S. Benson, M.B.E. [*F*]; *South Eastern*, Mr. H. Edgar Bunce, M.C. [*F*].

Note: All representatives, with the exception of Mr. John Bishop, served in the same capacity last year. Mr. Bishop succeeds Mr. Edwin Smith [*F*].

(B) University College, Hull: R.I.B.A. Representative on Court of Governors: Mr. Andrew Rankine, O.B.E. [*A*] reappointed.

(C) Illuminating Engineering Society: Dow Prize Competition: R.I.B.A. Representative on Prize Board: The Hon. Lionel Brett [*A*].

(D) R.I.B.A. Architecture Bronze Medal: Manchester Society of Architects: R.I.B.A. Representative to serve on Jury to consider Award: Mr. T. Nelson Cartwright, D.S.C. [*F*], President of the Nottingham, Derby and Lincoln Architectural Society.

The Honorary Associateship: By a unanimous resolution the Council invited Lord Bilsland, M.C., D.L., J.P., LL.D., and Dr. Nikolaus Pevsner, M.A., Ph.D., Hon. A.R.C.A., Hon. F.S.I.A., to accept nomination for election to the Honorary Associateship.

Direct Election to the Fellowship: By a unanimous resolution the following members of the Royal Australian Institute of Architects were elected to the Fellowship under the provisions of the Supplemental Charter of 1925, Section IV, Clause 4: *Past Presidents of the New South Wales Chapter, R.A.I.A.*: Adrian Olsson Ashton [*A*], Leith Cecil McCredie, Cobden Parkes, Frank William Turner. *Past Presidents of the South Australian Institute of Architects:* Dean Walter Berry, Herbert Harrold Jory, Frank Kenneth Milne, Walter John Mongan Sedgley.

Royal Academy Winter Exhibition: The Council agreed to a request from the Royal Academy for the loan of a number of architectural drawings for the Royal Academy Winter Exhibition on the first hundred years of the Royal Academy.

Government Building Research Programme, 1952-53: On the recommendation of the Science Committee the Council replied to an enquiry from the Ministry of Works on the Government Building Research Programme, 1952-53. The Institute were satisfied that the requirements of research were adequately covered by the programme, but a minor comment was made that in considering heating, ventilation and humidity of buildings, the specialised needs of farm buildings should be remembered.

Proposed Registration of Clerks of Works: In reply to a request from the Joint Committee for the Proposed Registration of Clerks of Works for support in their campaign for a registration act, the Council replied that the Institute would favour any action tending towards an improvement in the qualifications, training and status of clerks of works, and that accordingly the Joint Committee's proposals had the Institute's goodwill.

Scale of Fees for State-aided Housing Schemes: On the advice of the Practice Committee the Council accepted an invitation from the Ministry of Housing and Local Government to send a further deputation to discuss the possible revision of the Scale of Fees for State-aided Housing Schemes.

International Architectural Exhibitions: On the recommendation of the Public Relations Committee, the Council made representations to the Cultural Relations Department of the Foreign Office in regard to the architectural exhibit at the Milan Triennale and international exhibitions generally. The Council expressed the view that the Institute could not in future take part in the preparation of such exhibitions unless adequate financial support was provided and sufficient time was allowed for preparation.

Architectural Competitions: Fees Payable in the Event of Work not being Proceeded With: The Council approved a recommendation of the Competitions Committee that in view of the continuing stringency in the material and financial situation, some modification of the regulations for architectural competitions should be made in respect of both the time limit within which work must be begun and the percentage fee payable on higher cost projects in the event of the work not proceeding.

The Council accordingly approved the following revision to Clause E of the Regulations governing the promotion and conduct of architectural competitions:

'If, however, within the periods defined below, the author of the selected design is not instructed to proceed with the work, for reasons other than those contained in Clause 6, he shall be paid, including the premium, the following sums:

(*a*) If no instructions are given within two years of the date of the award:

1½ per cent on his estimate of cost up to £100,000.

½ per cent on the next £300,000.

⅓ per cent on the next £600,000.

(*b*) If no instructions are given within five years of the date of the award in competitions of an estimated value *exceeding* £1,000,000, he shall be paid as a first instalment and at the end of the second year the amounts detailed in paragraph (*a*). At the end of the fifth year from the date of the award he shall receive in addition:

¼ per cent of any sum in excess of £1,000,000. Such sums shall merge into the commission when the work is subsequently executed.

The provisions of the preceding paragraphs (*a*) and (*b*) shall also apply in the event of the promoters deciding to proceed with part of the work only, i.e. the author of the selected design shall be paid, including the premium, the difference between the scale fees on the work which is being carried out and the percentages named above on his estimate of cost and such sums shall merge into the commission when the remainder of the work is subsequently executed.'

A revision in similar terms to Clause 7 of the Model Form of Conditions was also approved.

Membership: The following members were elected: as Fellows, 11; as Associates, 17.

Students: 91 Probationers were elected as Students.

Applications for Election: Applications for election were approved as follows: *Election 11 December* 1951: as Fellows, 9; as Associates, 329; as Licentiates, 8. *Election 4 March* 1952 (*Overseas Candidates*): as Fellow, 1; as Associate, 1.

Application for Reinstatement: The following application was approved: as Licentiate, Walter Edward Welch.

Resignations: The following resignations were accepted with regret: Winston Walker [*F*], Miss Benedetta Day [*A*], Thomas Ellis [*L*], Thomas Milnes-Foden [*L*], Thomas Weaver [*L*].

Applications for Transfer to Retired Members' Class under Bye-law 15: The following applications were approved: as Retired Associates: James Allen Frew, Cecil Thomas Sherwin; as Retired Licentiate: Walter William Hitchins.

Obituary: The Secretary reported with regret the death of the following members: Henry Spencer Walcott Stone [*F*]. Mr. Stone was President of the Bristol and Somerset Society of Architects and represented that body on the Allied Societies' Conference. John Edward Burke [*A*], Frederick Fisher Christian [*A*], Thomas Charles Hardy [*A*], Raymond Frank Neave [*A*], Harold Clifford Ward [*A*], Albert Cunes [*L*], Bertram de Helsby [*L*], John Fogden [*L*], John Eric Osborne [*L*], Samuel Dennis Walley Timmins [*L*], William James Woods [*L*], Charles Frederick Deffee [*Retd. L*], Duncan Annandale [*Student*].

By resolution of the Council the sympathy and condolences of the Royal Institute have been conveyed to their relatives.

The President referred also to the sudden death of Mr. J. T. Middleton, W.S., Secretary of the Royal Incorporation of Architects in Scotland, and on his proposition a vote of sympathy with the Royal Incorporation in the loss they had thereby sustained was passed.

Membership Lists

ELECTION: 11 DECEMBER 1951

The following candidates for membership were elected on 11 December 1951:

AS FELLOWS (9)

Chilton: Edwin Raymond, M.T.P.I. [*A* 1941], Oxford.
Haddy: Joseph Alan [*A* 1941], Liverpool.
Nicholls: Ralph George [*A* 1936], Bridgwater.
Nisbet: Arthur George, B.A. (Arch.) (Lond.) [*A* 1935].
Tew: Ernest Frederick [*A* 1939], Bath.
Viney: Thomas Leslie [*A* 1940], Warrington.

and the following Licentiates who have passed the qualifying Examination:

Appleyard: Leslie Taylor, Leeds.
Bell: Richard Gray, Chessington.
Bradshaw: Leonard Robert, Kingston-on-Thames.

AS ASSOCIATES (329)

Abbott: Denys Scriven, Ilford.
Adie: Thomas Mountford, Dipl. Arch. (U.C.L.)
Allen: Frank Anthony, Dip.Arch. (Sheffield), Sheffield.
Andrews: Norman Hodder, Dip.Arch. (Cardiff), Barry, Glam.
Andrews: Raymond Denzil Anthony, Dipl.Arch. (U.C.L.).
Armstrong: Leslie Gordon, Romford.
Arnold: Arnold George, Deal.
Bailey: Geoffrey Ronald Wellington, Newport, Mon.
Ball: Stephen Hubert.
Bamsey: Eric George, B.A. (Lond.).
Barnard: John Laurence, Romford.
Bayliss: William Brian, Birmingham.

Begg: Ian McKerron, D.A. (Edin.), Kirkcaldy.
Berry: Dennis William, Dip.Arch. (Leics.), Aylesford.
Bestow: Edward William, Dipl.Arch. (U.C.L.), Esher.
Beswetherick: Geoffrey, Penzance.
Bickerton: Lavender Margaret (Miss), Cobham.
Bird: Anthony, Newcastle-on-Tyne.
Black: Duncan Ian, D.A. (Edin.), Edinburgh.
Blair: Peter, Order of Leopold II and Croix de Guerre, B.A. (Arch.) (Lond.), Gloucester.
Blythe: John Charles Welton, Dipl.Arch. (Leeds), Leeds.
Bortoft: Harry, Dipl.Arch. (Leeds), Harlow.
Bott: Arthur Randell Hulton, D.A. (Edin.), Edinburgh.
Boyd: William Traynor, Huddersfield.
Bradford: Howard Owen Turnor, D.S.C., Eastbourne.
Brain: David Francis.
Brake: Mervyn Francis, Dip.Arch. (Cardiff), Corby.
Briars: Geoffrey Alan, Dip.Arch. (Leics.), Leicester.
Bright: Alec Stenning.
Brown: Basil Michael, D.A. (Edin.), Edinburgh.
Brown: John Geoffrey, Bexley.
Brown: Peter James.
Browne: George Robert, Newton Aycliffe.
Brunskill: Ronald William, B.A. (Arch.) (Manchester), Manchester.
Buchanan: Jean Margaret (Miss), Salisbury.
Burgess: Henry William David, Dip.Arch. (Cardiff), Treforest.
Burgess: Roger Arthur, B.Arch. (L'pool), Heswall.
Burles: Bernard Albert.
Burrell: James Albert, Romford.
Butler: David Merton, D.A. (Dundee), Malvern.

Caird: Peter Burnett, Edinburgh.
Callaghan: Denys Austin, Dipl.Arch. (Leeds), Leeds.
Carpenter: Ronald Dudley, East Molesey.
Carter: William Brian, Manchester.
Cavanagh: Patricia Frances Garfit (Miss), D.A. (Edin.).
Chadwick: Barry Arthur, Reading.
Chalmers: Denis George Macgregor.
Chaplin: George Charles, Portadown.
Chidlaw: Robert Ian, Carshalton Beeches.
Clark: William Lloyd.
Clarke: Leonard Louvain, Folkestone.
Clarkson: Allan Raine, Darlington.
Clayton: Albert, Nottingham.
Clews: Arnold Percy, Timperley.
Collick: Thomas Richard, Dipl.Arch. (Leeds), Leeds.
Collings: Michael Clayton, Bristol.
Collins: John Edward, Monkstown, Co. Dublin.
Cook: Arthur Bernard, D.F.C., Chichester.
Cooksey: Arthur Paterson, Dipl.Arch. (U.C.L.), Addlestone.
Coombs: Francis, Dip.Arch. (Manchester), Manchester.
Copcutt: Geoffrey, Chigwell.
Copeland: William Mawson, Dip.Arch. (Sheffield), Doncaster.
Corfield: John Leigh, Swansea.
Craig: Alan Stewart, Epsom.
Crane: Gerald Ernest, Woodford Green.
Cross: John Lewis, Bristol.
Cullen: Norman Henderson, D.A. (Dundee), Dundee.
Cunningham: Ivor Richard, Bexleyheath.
Curd: Peter Alan, Dipl.Arch. (U.C.L.), Loughton.

Dabner: Martyn Ronald, Gravesend.
Dainton: Desmond John, Dip.Arch. (Leics.), Leicester.
Daniel: Harwin Morris, Dipl.Arch. (Oxford), Swansea.
Davey: Cyril James William, Dip.Arch. (Leics.), Leicester.
Davey: Peter Brueton, Shepton Mallet.
Davies: Trevor de Pont, Whitstable.
Deacon: Myra Joy (Miss), Croydon.
Dearden: Derek George, B.A. (Arch.) (Manchester), Solihull.
Dennys: John Edward, M.C.
Derwent: Clifford Sydney.
Dias: Edward Louis, Aberdeen.
Dickens: Alan.
Donnithorne: Cyril Reginald James, Southsea.
Dornan: William, Belfast.
Douglas: Alan.
Dowling: Vincent, Wallasey.
Downs: Sydney Bertram, B.A. (Arch.) (Manchester), Manchester.
Dransfield: Lydia (Mrs.).
Duncan: Wallace Hugh Charteris, Croydon.
Durrant: Sidney Jack, Luton.
Eagleson: Sloan Henry, Dip.Arch. (Cardiff), Cardiff.
Edwards: John Gordon Michael, Dip.Arch. (Cardiff), Market Harborough.
Edwards: Michael John Charles, Esher.
Evans: David Douglas, Dip.Arch. (Cardiff), Barry.
Evans: John, B.A. (Cantab.), Torquay.
Farrington: Nigel Herbert, Maidstone.
Faul: Fred Walter.
Fitzwilliam: Richard Louis, Port Talbot.
Flanagan: Donal O'Neill, Waterford.
Foode: Peter Thomas, Dip.Arch. (Leics.), Leicester.
Foster: John, Boston.
Franck: Carlludwig Philipp.
Frankum: Albert Charles.
Frere-Smith: Geoffrey Naftel, Maidstone.
Fried: Jorgen Heinz.
Gammans: John David Morgan, Stroud, Glos.
Garrett: Ruth Helen (Miss), Dipl.Arch. (U.C.L.).
Gasson: Arthur John.
George: Ronald William, Hastings.
Gibbs: Ian Hugh.
Gibson: Henry Atherton Derek, Dip.Arch. (Cardiff), Cardiff.
Gillies-Reyburn: David Hugh.
Glover: Ann de Courcy (Miss), Totnes.
Gordon: Ian Charles, Dipl.Arch. (U.C.L.), Leicester.
Gourlay: George Stuart, D.A. (Edin.), Edinburgh.
Gower: William Lawford, Dip.Arch. (Cardiff), Cardiff.
Greenberg: Terence, B.A. (Arch.) (Manchester), Manchester.
Gregory: Patrick Brian, B.A. (Belfast), Belfast.
Guilmant: Philip Thomas.
Hadfield: Joseph Charles, Salford.
Haile: Norman Watson.
Hamill: Peter, Gravesend.
Hanna: Maurice Edward.
Hardy: Anthea Evelyn (Mrs.), B.A. (Arch.) (Lond.), High Wycombe.
Hardy: Eric Edward, B.A. (Arch.) (Lond.), High Wycombe.
Hare: Elizabeth Mary (Mrs.), Stow-on-the-Wold.
Harris: Sidney John, Romford.
Harrison: Lorna (Miss), Gateshead.
Hartley: Anthony Edward, Dip.Arch. (Cardiff), Barry.
Hawkins: Geoffrey Arthur, Harpenden.
Hayhurst: William, Manchester.
Henderson: Geoffrey Charles.
Hewitt: Phillip Walter, Chester.
Heywood: Arthur John, Marple.
Hichisson: Marjorie Dorothy (Miss).
Hill: Perry Martin, Hassocks.
Hills: William Aubrey Hyde, Dip.Arch. (Manchester), Hale.
Hiscock: Duncan Heath, Gravesend.
Hodge: Andrew Watson, Glasgow.
Hogarth: Derek James.
Hogger: James Arthur, East Molesey.
Holderness: John Anthony, Watford.
Holmes: George, Grantham.
Holt: Arthur Playfair, Eccles.
Home: William, D.A. (Edin.), Edinburgh.
Hounsell: Ronald Leslie.
Howard: Jeffrey Raymond.
Howland: John.
Hudson: Kenneth, Dipl.Arch. (Oxford), Wrexham.
Hussey: Henry John, Cobham.
Jenkins: Clifford, Cardiff.
John: Ronald, Dip.Arch. (Cardiff), Welling.
Jones: Richard Alun, Dip.Arch. (Cardiff), Cardiff.
Jordan: Eric Robert, Horley.
Juppenlatz: Morris, Maidstone.
Kanhere: Hari Mukund.
Kaye: Alan John, B.A. (Lond.).
Keeble: William Gass, Maldon.
King: Harold, Oldham.
Kossak: Krzysztof Jan, B.A. (Arch.) (Manchester).
Kretchmer: William.
Lamb: Alan Wells, Dip.Arch. (Cardiff), Newport, Mon.
Lambert: John, Epsom.
Lansdown: Robert John, Dip.Arch. (Cardiff), Cardiff.
Latté: Rolf, B.Arch. (Manchester), Bath.
Law: John, Preston.
Layton: Jean Margaret (Miss).
Leapingwell: Elizabeth Jane (Miss), Jersey, C.I.
Lester: Thomas Anthony, Dip.Arch. (Manchester), Eccles.
Lewer: David James.
Little: Margaret McLaurin (Miss), D.A. (Edin.)
Lloyd: Harry, B.Arch. (L'pool), Chorley.
Lloyd: John.
Lofts: Anthony Duncan, Romford.
Logan: James Maxwell, Dip.Arch. (Manchester), Altrincham.
Low: Allan Andrew, B.A. (Arch.) (Lond.).
Lyons: Roy Desmond.
McCaig: Douglas Victor, Dip.Arch. (Manchester), Manchester.
McCrossan: Derek Gordon, Bramhall.
McEwan: Alexander, Barking.
McKinley: Peter John, Dipl.Arch. (U.C.L.), Witham.
McMichael: William, D.A. (Edin.), Stirling.
Malloch: Andrew Thompson, Gravesend.
Marple: John Ray, Dip.Arch. (Sheffield), Sheffield.
Mason: Geoffrey Thomas, Dip.Arch. (Manchester), Bowdon.
Mather: Alan, Dip.Arch. (Sheffield), Colchester.
Meek: Harold Alan, B.A. (Arch.) (Manchester), Manchester.
Mellor: George Edward, Stoke-on-Trent.
Mellors: George Alan, B.A. (Arch.) (Sheffield), Sheffield.
Meredith: Bernard, Manchester.
Methven: Maurice Stuart, Southsea.
Millin: Norman Charles, Herne Bay.
Mills: Geoffrey William.
Mitchell: Ivan Victor, Nottingham.
Morgan: John David, Dipl.Arch. (U.C.L.).
Munce: James Frederick, Belfast.
Munday: Michael George, Dip.Arch. (Leics.), Sheringham.
Murray: Alexander Elliot, South Queensferry.
Myers: Geoffrey Thomas.
Nellist: Arthur Ivan, Hull.
Newcombe: Philip Geoffrey, Cheltenham.
Newman: Kenneth William, Ruddington.
Nixon: Leslie Harold, Woodford Green.
Nursey: Dennis Henry Alfred, Ashford, Kent.
Nutter: Frederick George Francis.
Ogden: Jack, Bradford.

Olsen: Rider Raymond, B.Arch. (Rand).
Ormond: Alan Campbell, Glasgow.
Osler: Neil Thomas, B.Arch. (Manitoba).
Pannett: Roy Charles, Hemel Hempstead.
Pantlin: John Sidney, Wimborne.
Parker: Ronald Mavin.
Parr: Vivian Edwin, Dip.Arch. (Cardiff), Cardiff.
Paton: Valentine Stewart, Fareham.
Payne: Ronald, Newport, Mon.
Pearce: Roy Pincombe Clayton, Dip.Arch. (Sheffield), Sheffield.
Pemberton: Roy, Nuneaton.
Perkins: Richard Marshall, D.S.O., Romsey.
Pollard: Henry Bernard, Dip. Arch. (Manchester), Burnley.
Preston: Peter Robert, B.A. (Cantab.), Dipl. Arch. (U.C.L.), Weybridge.
Price: Walter Frederick, Dipl.Arch. (Oxford), Swansea.
Pullin: Ronald George, Coventry.
Quarress: Sidney King.
Quirke: John Patrick.
Rankine: George William Terry, Dunfermline.
Reid: John Herdman, D.A. (Edin.), F.S.A. (Scot.), Edinburgh.
Rice: Brian Thomas Henry, Dip.Arch. (Nottm.), Derby.
Rice: Geoffrey Frank, Southsea.
Richards: Herbert James, Dipl.Arch. (U.C.L.), Markinch.
Ridgewell: Peter Harold, Swansea.
Rigby-Jones: Peter, B.A. (Arch.) (Lond.).
Ringland: Frank Lindsay, Bangor, N. Ireland.
Robinson: Denis Curtis.
Robinson: Derek Leonard, Dipl.Arch. (U.C.L.), Ilford.
Roche: Louis Adair, B.A. (Arch.) (Lond.), Kilkenny, Eire.
Rose: Percival Harold, A.R.I.C.S., Christchurch.
Row: Dennis Richard Frank.
Rowlands: Arnold James, D.A. (Edin.), Richmond, Surrey.
Russell: Norman, Ely.
Sames: Vernon John, Sutton.
Sanderson: John Ernest Douglas, B.A. (Cantab.) D.A. (Edin.), Edinburgh.
Scadding: Ernest Frank, Birmingham.
Scott: John Mervyn, Norwich.
Scott-Mitchell: Godfrey Varley Pickering, Dipl.Arch. (U.C.L.).
Seale: John Henry, Kingsbridge.
Shackleton: Joyce (Miss), Liverpool.
Sheldon: Hugh Roy Watson, Dip.Arch. (Manchester), Rotherham.
Sheppard: John Claydon, Dip.Arch. (Birm.), Solihull.
Shipman: Sidney George Eustace, Bridge-of-Allan, Stirlingshire.
Skelton: William Ronald, Dip.Arch. (Birm.), Stourbridge.
Sleight: Harry, Stockport.
Smail: William Prophet, D.A. (Dundee), Ballinluig, Perthshire.
Smart: Derek John, Birmingham.
Smith: Alan Tune, Dip.Arch. (Sheffield), Sheffield.
Smith: Hamish Haldane Haswell, D.A. (Edin.), Edinburgh.
Smith: John Bendell, Bristol.
Smith: John Sidney, Whitchurch, Glam.
Southgate: Sidney Edward.
Staley: Sheila Mary (Miss), Bexhill-on-Sea.
Stedman: John.
Steele: Stuart, Luton.
Stevens: John Alfred.
Stevens: Peter Herbert Marryat, Edinburgh.
Stewart: John Robertson, D.A. (Dundee), St. Andrews.
Stille: Robert, M.C., S.A.D.G.
Stockton: George Neville, Luddenden Foot.
Stokes: Arthur Thomas John.
Stringer: Thomas Allingham, Belfast.
Surgey: Edwin Hurford, Dipl.Arch. (U.C.L.), Crediton.
Sutherland: Magnus Mowat.
Sykes: George Dennis, M.A. (Cantab.), A.R.I.C.S.
Tainsh: James Charles Edwards, D.A. (Dundee) Beverley.
Taper: Norah (Miss), Reading.
Tatum: Leonard Edward.
Taylor: Alexander Robert, Fraserburgh.
Taylor: Elwyn Andrew Fairney, Stockport.
Taylor: John Ernest, Jersey, C.I.
Taylor: Robert Alexander, Elgin.
Thomas: David Ellis Wyn, B.Arch. (Wales), Cardiff.
Thomas: Peter Michael, B.A. (Cantab.) D.A. (Dundee), Cheltenham.
Thomas: William Noel.
Thompson: Charles Derek, Wakefield.
Tomlinson: George Grahame, Handforth.
Toms: Vivien Joyce (Miss), Plymouth.
Turner: James Walker, Prestwick.
Uffindell: Geoffrey Herbert, Kingston Hill.
Vawser: Joan Mabel (Miss), B.A. (Arch.) (Manchester), Bristol.
Vickery: David John, Leadenham.
Voisey: Edwin John, Grays.
Vroome: Gaston Pierre Jacques, Dipl.Arch. (U.C.L.).
Waldron: Ernest William, Worthing.
Walker: James Cantlie, Banff.
Wallace: John Ridley, Dip.Arch. (Nottm.), Nottingham.
Walters: James Dudley, Dip.Arch. (Cardiff), Llanelly.
Ward: John.
Ward: William Robert Victor, Dip.Arch. (Cardiff), Swansea.
Warman: Noel Leslie, Cobham.
Warmington: Gordon Stuart.
Waters: George William, Bedford.
Watkins: John Michael, Leigh-on-Sea.
Watkins: Ronald, Cardiff.
Webb: John Osborne, Dip.Arch. (Cardiff), Cardiff.
Wedgwood: Harold Roland, Dip.Arch. (The Polytechnic), Watford.
Wellings: Samuel Thomas, Bilston.
West: Hugh Philip Henry, Maidstone.
Westlake: Colin John Gilbert, Dip.Arch. (Cardiff), Tenby.
Whalley: Maurice, Bristol.
Wiehahn: Bernard Eduard Elliott.
Wilburn: Dennis Edgar, Doncaster.
Wilkinson: Ralph Ewart.
Wilkinson: Thomas William, Preston.
Willett: Frederick Edward, Peterborough.
Williams: Cyril Gordon, Bromsgrove.
Williams: Edward Jones, Criccieth.
Williams: Kenneth Sullivan, Bolton.
Williams: Norman James, Dip.Arch. (Cardiff), Coleford.
Williams: Raymond Samuel, Dip.Arch. (Cardiff), Bracknell.
Williamson: Thomas William, Basingstoke.
Wilson: Arthur Dallimore, Kirkintilloch.
Wilson: George Trevenen, Rowlands Castle.
Wimpenny: Geoffrey George, Dip.Arch. (Manchester), Manchester.
Wingrave: Ernest Alexander, Flixton.
Wood: John Michael, M.B.E., Bromley, Kent.
Wood: Robert James, Bickley.
Woodhouse: Sidney Walter.
Wraight: James Ralph, Rochester.
Wright: Charles Alexander, Portslade.
Wroughton: Barbara Percival (Mrs.), Dipl.Arch. (U.C.L.).
Wroughton: Herbert John, B.A. (Arch.) (Lond.).
Wynyard: Victor Douglas, Malden.

AS LICENTIATES (8)

Carden: Edward Stanley, Glasgow.
Cripps: Arthur Sam, Cowes.
Holmes: Archibald Douglas, Glasgow.
Myers: Joseph Caleb, Haverill, Suffolk.
Oldfield: Jack Vickerman, Grimsby.
Pescod: David Richard Max, Surbiton.
Smith: Eric William Francis, Birmingham.
Syddall: George, Middleton.

ELECTION: 8 JANUARY 1952

An election of candidates for membership will take place on 8 January 1952. The names and addresses of the candidates with the names of their proposers, found by the Council to be eligible and qualified in accordance with the Charter and Bye-laws, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Monday 31 December 1951.

The names following the applicant's address are those of his proposers.

AS HON. ASSOCIATES (2)

Bilsland of Kinrara, The Lord, M.C., D.L., LL.D., Garden, Buchlyvie, Stirlingshire. Proposed by the Council.

Pevsner: Nikolaus Bernhard Leon, M.A., Ph.D., F.S.A., 2 Wildwood Terrace, N.W.3. Proposed by the Council.

AS FELLOWS (6)

Harrison: William Thomas [*A* 1944], 10 Knowsley Buildings, 15 Tithebarn Street, Liverpool, 2; 4 Manor Mansions, Manor Road, Wallasey. M. G. Gilling, F. C. Saxon, Harry Banister.

Kelly: Howard Lawrence [*A* 1931], 6 Avery Row, New Bond Street, W.1; May Cottage, West Hyde, Rickmansworth, Herts. M. S. Briggs, C. J. Epril, H. A. Mealand.

Simpson: Robert Alison Crighton, T.D., B.A. [*A* 1929], 43 Market Square, Duns, Berwickshire, Scotland; The Wellnage, Duns. J. R. McKay, Alexr. Cullen, A. N. Malcolm.

Thompson: Gerald Leopold [*A* 1929], Clifton Chambers, Park Street, Selby, Yorks; 127 Leeds Road, Selby. Harold Conolly, Denis Senior, T. H. White.

Tolson: Jack Ransom, Dipl.Arch. (Leeds), A.M.T.P.I., Dipl.T.P. (Leeds) [*A* 1930], The School of Architecture and Building, Oxford; 32 Blenheim Drive, Oxford. H. F. Hurcombe, T. T. Cumming, David Beecher.

and the following Licentiate, who is qualified under Section IV, Clause 4 (*c*) (ii), of the Supplemental Charter of 1925:

Thomas: George Frederick, Messrs. J. Alfred Harper and Son, 63 Temple Row, Birmingham, 2; 58 Brecon Road, Handsworth, Birmingham, 20. L. E. Harper, G. B. Cox, A. J. Margetson.

AS ASSOCIATES (73)

The name of a school, or schools after a candidate's name indicates the passing of a recognised course.

Avenell: Anthony [Final], 15 Littledown Avenue, Queen's Park, Bournemouth. A. E. Geens, Frank Scarlett, R. A. Phillips.

Baker: Hugh Wesley [Special Final], 'Hildenborough', 86 Chessel Crescent, Bitterne, Southampton. Applying for nomination by the Council under Bye-law 3 (*d*).

Beaton: Charles, Dip.Arch. (Abdn.) (Aberdeen Sch. of Arch.: Robert Gordon's Tech. Coll.), c/o 62/64 Bon Accord Street, Aberdeen. E. F. Davies, J. A. O. Allan, J. A. Allan.

Benoy: Kenneth William [Final], 'Gardinia', 25 Mayland Road, Bedhampton, Havant, Hants. A. C. Townsend, J. V. Nisbet, C. W. Wilkins.

Booth: Anthony John Gorton, Dip.Arch. (The Polytechnic) (The Poly., Regent Street (London): Sch. of Arch.), 42 Elms Avenue, Muswell Hill, N.10. J. S. Walkden, Basil Spence, C. A. Lucas.

Bowles: Winifred Delmer (Miss) (Nottingham Sch. of Arch.), 23 Thorncliffe Road, Nottingham. Applying for nomination by the Council under Bye-law 3 (*d*).

Cockburn: David Bethune, D.A. (Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 'Agda', 26 Bingham Road, Portobello, Midlothian. H. Wilson, Leslie Grahame-Thomson, Frank Wood.

Cocker: Philip Stanley [Final], 38 Chorley New Road, Bolton. L. C. Howitt, F. L. Halliday, Cecil Stewart.

Denholm: Peter Campbell [Final], 20 Broomberry Drive, Gourock, Renfrewshire. James Bell, F. R. Burnet, Prof. W. J. Smith.

Dixon: Maurice George [Final], 52 Grange Avenue, North Finchley, N.12. Applying for nomination by the Council under Bye-law 3 (*d*).

Dodson: Robert George, Dip.Arch. (Leics.) (Leicester Coll. of Art and Tech. Sch. of Arch.), 1 Acacia Avenue, Birstall, Leicestershire. F. Chippindale, S. Penn Smith, G. A. Cope.

Dymond: John Hodgson, Dip.Arch. (Cardiff) (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), 10 Keats Close, The Gaer, Newport, Mon. Lewis John, Harry Teather, C. F. Jones.

Economou: Stavros N. [Special Final], 10 Lancaster Drive, Hampstead, N.W.3. C. W. Box, C. A. Lucas, A. R. Borrett.

Edwards: Elizabeth Rosemary (Miss) (The Poly., Regent Street (London): Sch. of Arch.), Witley, South Street, Whitstable, Kent. J. S. Walkden, Edward Armstrong, Frederick MacManus.

Elsey: Samuel George (Victoria Univ., Manchester: Sch. of Arch.), 406 Wilmslow Road, Withington, Manchester, 20. Prof. R. A. Cordingley, H. T. Seward, J. P. Nunn.

Elstub: Dorothy Margaret (Miss) [Special Final], Orchard House, Banbury Road, Southam, Warwicks. H. T. Jackson, Rolf Hellberg, W. S. Hatrell.

England: Philip George, Dip.Arch. (Manchester) (Victoria Univ., Manchester: Sch. of Arch.), 27 Courtfield Road, Kensington, S.W.7. Prof. R. A. Cordingley, Dr. Charles Holden, The Hon. Godfrey Samuel.

Evans: Marjorie Elizabeth (Miss), D.A. (Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 49 Cadogan Street, S.W.3. Felix Walter, E. Riss, Z. Sirotkin.

Evans: William Angus, Dip.Arch. (Cardiff) (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), 4 Trem-y-Don, Barry, Glam. Lewis John, Harry Teather, C. F. Jones.

Eyre: John, A.R.I.C.S. [Special Final], 72 Ulleswater Road, Southgate, N.14. Prof. Stephen Welsh, J. C. A. Teather, H. A. Mealand.

Forsyth: Robert, D.A. (Glas.) (Glasgow Sch. of Arch.), 607 Duke Street, Glasgow, E.1. Prof. W. J. Smith, N. R. J. Johnston, A. McAnally.

Fox: Owen William [Special Final], 41 Peverel Road, Cambridge. Norman Keep, W. A. Rutter, L. T. Sloot.

Gallagher: John Matthew [Final], 45 The Glade, Ewell, Surrey. R. N. Vanes, F. D. Mills, J. S. Walkden.

Gibbons: Ross Smith, Dip.Arch. (Manchester) (Victoria Univ., Manchester: Sch. of Arch.), 2 Vigo Avenue, Bolton. Prof. R. A. Cordingley, J. P. Nunn, G. S. Pester.

Greenwood: Arthur, B.Arch. (Sydney) (Passed a qualifying Exam. approved by the R.A.I.A.), 'Overdale', Gee Cross, Hyde, Cheshire. J. L. S. Mansfield, E. L. Thompson, W. R. Laurie.

Greig: William Murray, D.A. (Dundee) (Dundee Coll. of Art: Sch. of Arch.), 65 Dundee Street, Carnoustie, Scotland. John Needham, T. H. Thoms, G. C. Young.

Groocock: Brian Wilson, Dipl.Arch. (Leeds) (Leeds Sch. of Arch.), 1 Headingley Mount, Leeds, 6. W. A. Eden, D. A. Fowler, N. H. Fowler.

Hancock: Peter Reginald Lawrence, Dipl.Arch. (Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 48 Staunton Road, Headington, Oxford. E. A. L. Martyn, A. B. West, David Beecher.

Harris: Raymond Govette (Arch. Assoc. (London): Sch. of Arch.), 78 Mill Road, Cambridge. Henry Elder, George Fairweather, J. H. Markham.

Harrison: Peter, Dip.Arch. (Manchester) (Victoria Univ., Manchester: Sch. of Arch.), 106 Dudley Road, Whalley Range, Manchester, 16. Prof. R. A. Cordingley, F. L. Halliday, J. P. Nunn.

Hayes: George Andrew [Final], 10 Clegg Street, Oldham. Cecil Stewart, Harold Bowman, Frederick Thorpe.

Hennings: Michael Hugh [Final], 2 Chipstead Street, S.W.6. J. E. Dixon-Spain, Dr. J. L. Martin, J. S. Walkden.

Howarth: James McIntosh, Dip.Arch. (Manchester) (Victoria Univ., Manchester: Sch. of Arch.), 17 South Hill Street, Oldham. Harold Bowman, G. B. Howcroft, Frederick Thorpe.

Keegan: Brinley James, Dip.Arch. (Cardiff) (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), 16 Milton Road, Penarth, Glam. Lewis John, Harry Teather, C. F. Jones.

Koppenhagen: Ann Pamela (Miss), Dipl.Arch. (U.C.L.) (Bartlett Sch. of Arch.: Univ. of London), 33 Ranulf Road, N.W.2. Prof. H. O. Corfiato, D. du R. Aberdeen, R. C. White-Cooper.

Lasham: Humphrey John, Dip.Arch. (The Polytechnic) (The Poly., Regent Street (London): Sch. of Arch.), 62 The Woodlands, Southgate, N.14. J. S. Walkden, David Jenkin, W. W. Fisk.

Linfield: Gerald Arthur (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 33 The Grates, Cowley, Oxford. E. A. L. Martyn, David Beecher, A. B. West.

Locke: Thomas, D.A. (Glas.) (Glasgow Sch. of Arch.), c/o the County Architect's Dept., County Offices, Aylesbury, Bucks. A. G. Henderson, Prof. W. J. Smith, F. A. C. Maunder.

Lopacki: Richard, Dip.Arch. (Nottm.) (Nottingham Sch. of Arch.), 94 Australia Road, Cardiff. Lewis John, T. A. Lloyd, C. F. Jones.

McGuire: Hilda Patricia (Miss), B.Arch. (L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 104 Lansdowne Road, Belfast, N. Ireland. Prof. L. B. Budden, B. A. Miller, F. X. Velarde.

McIntosh: John Malcolm, B.A. (Arch.) (Lond.) (Bartlett Sch. of Arch.: Univ. of London), 1 Castellain Road, W.9. Prof. H. O. Corfiato, D. du R. Aberdeen, R. C. White-Cooper.

Marsh: Frank Henry [*L*] [Special Final], 55 Culmington Road, Ealing, W.13. J. S. Walkden, A. G. Alexander, A. D. Reid.

Mills: Kenneth James, Dip.Arch. (Cardiff) (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), 83 Romilly Road, Canton, Cardiff. Johnson Blackett, Lewis John, Harry Teather.

Mitchell: Thomas Brown [Special Final], 40 Whitby Drive, Grimsby, Lincs. Applying for nomination by the Council under Bye-law 3 (*d*).

Moir: Stanley Rice, Dip.Arch. (Abdn.) (Aberdeen Sch. of Arch.: Robert Gordon's Tech. Coll.), 561 Great Western Road, Aberdeen. E. F. Davies, Fenton Wyness, J. G. Marr.

Moody: Alan Edward (Northern Poly. (London): Dept. of Arch.), 261 Lea View House, Springfield, Clapton, E.5. T. E. Scott, S. F. Burley, Harold Bramhill.

Moorby: Richard Preston [Final], 96 Tyrwhitt Road, Brockley, S.E.4. R. W. Stoddart, F. G. A. Hall, T. F. Ford.

Muddiman: Ann Elizabeth (Mrs.), B.A. (Arch.) (Lond.) (Bartlett Sch. of Arch.: Univ. of London), 65 The Burroughs, Hendon, N.W.4. Prof. H. O. Corfiato, D. du R. Aberdeen, R. White-Cooper.

Noble: Eric Robery [Special Final], 1 Thetis Terrace, Kew, Richmond, Surrey. H. T. B. Barnard, Edward Armstrong, C. G. Stillman.

Nussbaum: Bruno [Final], 43 Basing Hill, N.W.11. C. L. Gill, Prof. H. O. Corfiato, Z. Sirotkin.

Pegg: Graham Morris [Final], 47 North Denes Road, Great Yarmouth. E. W. B. Scott, and the President and Hon. Sec. of the Norfolk and Norwich Assn. of Archts. under Bye-law 3 (*a*).

Rew: David, D.A. (Glas.) (Glasgow Sch. of Arch.), 9 Hill Street, Radnor Park, Clydebank, Glasgow. Prof. W. J. Smith, William McCrea, G. W. Robertson.

Richardson: Norman [Special Final], 13 The Avenue, Durham. P. C. Newcombe, Prof. W. B. Edwards, J. H. Napper.

Sanderson: Peter Anthony Calley [Special Final], 21 Totham Lodge, Richmond Road, S.W 20. T. E. Scott, H. Bramhill, J. F. Howes.

Sane: Sadashiv Dhondo [Final], 5 Glenloch Road, N.W.3. Prof. S. S. Reuben, H. N. Dallas, G. B. Mhatre.

Searle: Peter Arthur, Dipl.Arch. (U.C.L.) (Bartlett Sch. of Arch.: Univ. of London), 1 Reigate Road, Ewell, Surrey. Prof. H. O. Corfiato, D. du R. Aberdeen, S. L. Thomson.

Smith: Brian David (Northern Poly. (London): Dept. of Arch.), 26 Bush Hill Road, Winchmore Hill, N.21. T. E. Scott, Frederick MacManus, Edward Armstrong.

Smith: Ernest Brian (Victoria Univ., Manchester: Sch. of Arch.), 48 Heaton Road, Heaton Norris, Stockport, Cheshire. Prof. R. A. Cordingley, J. P. Nunn, G. B. Howcroft.

Spicer: George Edward [Special Final], 99 Gatton Road, S.W.17. F. G. Goodin, E. M. Rice, Paul Nightingale.

Stanford: Frederick James Harding [Final], 33 Francis Avenue, Feltham, Middlesex. N. T. Myers, H. R. Chanter, A. D. Robinson.

Stevenson: Charles Cushnie, D.A. (Glas.) (Glasgow Sch. of Arch.), 117 Haughburn Road, Glasgow, S.W.3. Prof. W. J. Smith, N. R. J. Johnston, A. McAnally.

Stothard: Doreen Marguerite (Miss), Dip.Arch. (Dunelm) (King's Coll. (Univ. of Durham), Newcastle-upon-Tyne: Sch. of Arch.), 11 Stanhope Gardens, N.6. Prof. W. B. Edwards, J. H. Napper, C. A. Harding.

Stoughton-Harris: Pamela Mary Winifred (Miss), B.A. (Arch.) (Lond.) (Bartlett Sch. of Arch.: Univ. of London), 'Rosegarth', Waldens Road, Horsell, Woking. Prof. H. O. Corfiato, D. du R. Aberdeen, R. White-Cooper.

Swann: Henry George [Special Final], 264 Green Lane, Norbury, S.W.16. W. A. Rutter, C. G. Mant, A. G. Alexander.

Swann: Patrick Graham, D.A. (Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 4 Home Park, Aberdour, Fife. William Williamson, J. R. McKee, R. J. Gardner-Medwin.

Tabraham: Graham Dennis [Final], 8 The Croft, Barnet, Herts. Applying for nomination by the Council under Bye-law 3 (*d*).

Tear: Geoffrey Irons [Special Final], 11 Northerwood Avenue, Swan Green, Lyndhurst, Hants. Applying for nomination by the Council under Bye-law 3 (*d*).

Tiktin: Harold [Final], 48 Electric Avenue, Westcliff-on-Sea, Essex. J. M. Scott, G. A. Jellicoe, G. R. Dawbarn.

Tomalin: Margaret (Mrs.) [Final], Elsinore Court, 12 Wilbraham Road, Fallowfield, Manchester. A. Douglas Jones, L. Yates, Henry Elder.

Turner: John Douglas, A.A. Dipl. (Arch. Assoc. (London): Sch. of Arch.), 33 Tudor Close, Hampstead, N.W.3. Henry Elder, R. F. Jordan, Arthur Korn.

Turner: Keith Allerton [*L*] [Special Final], 65 Aldbourne Road, W.12. L. S. Stanley, Edgar Ranger, F. S. Haynes.

West: Richard Fraser, M.C. [Special Final], 18 Holly Bank, Bromley Road, Brighton. K. E. Black, H. M. Pett, S. H. J. Roth.

Wynne-Williams: Ronald Ormonde [Final], 10 Old Devonshire Road, Balham, S.W.12. A. H. Moberly, J. A. Slater, Norman Keep.

AS LICENTIATES (8)

Baines: Arthur, c/o Messrs. Essex, Goodman and Suggitt [*F*/*A*], 21 Waterloo Street, Birmingham, 2; 'Grantock', Eastcote Lane, Hampton in Arden, Birmingham. Applying for nomination by the Council under Bye-law 3 (*d*).

Boundy: Sidney, 2/4 Richmond Road, Exeter, Devon; Higher Park, Cruwys Morchard, Devon. Applying for nomination by the Council under Bye-law 3 (*d*).

Cheasley: Francis Harman, Ministry of Works, 78 Onslow Gardens, South Kensington, S.W.7; 'Clevedon', 30 Winsford Gardens, Westcliff-on-Sea, Essex. Neil Martin-Kaye, Z. Sirotkin, G. C. Wilson.

Hesketh: Henry David, c/o Directorate General of Works, W.8, Air Ministry, Bush House (N.E.), Aldwych, W.C.2; 399 Upper Elmers End Road, Beckenham, Kent. Paul Badcock, A. S. Roberts, Hugh Casson.

Marriott: Eric Charles, c/o Directorate General of Works W.8, Air Ministry, Bush House (N.E.), Aldwych, W.C.2, 104 Manor Way, Barnehurst, Bexley Heath, Kent. S. W. Neighbour, Alfred Forrester, Paul Badcock.

Sweatman: Herbert Buchanan, Chief Assistant Architect, Municipal Buildings, Gillingham Kent; 92 Livingstone Road, Gillingham. H. Anderson, H. C. Ashenden, B. W. Fitch-Jones.

Turner: Richard, Ministry of Works, London; Leigh Court Cottage, Cobham, Surrey. Sir Charles Mole, W. A. Rutter, A. G. Alexander.

Woodward: Lionel Orford, 20 St. George's Place, York; 9 Muncastergate, York. Colonel R. B. Armistead, Colonel A. E. Henson, W. M. Epps.

ELECTION: 1 APRIL 1952

An election of candidates for membership will take place on 1 April 1952. The names and addresses of the overseas candidates, with the names of their proposers, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Saturday 15 March 1952.

AS FELLOWS (2)

The names following the applican 's address are those of his proposers.

Nilgiria: Jamshed Cowasjee [*A* 1947], Messrs. Edwards, Reid and Begg. Prince Building, Prince Street, Colombo, Ceylon; 19 Union Place, Colombo. Prof. S. S. Reuben, Prof. Claude Batley, O. Weerasinghe.

Parker: Robert Geoffrey [*A* 1936], School of Architecture, The University of Melbourne, Victoria, Australia. Miss Jane Drew, R. Gardner-Medwin, Prof. B. B. Lewis.

AS ASSOCIATES (8)

Atkinson: James Duncan, B.Arch. (C.T.) (Passed a qualifying Exam. approved by the I.S.A.A.), 7 Eikenhof, Main Road, Kenilworth, Cape, S. Africa. H. L. Roberts, Prof. L. W. T. White, O. Pryce Lewis.

Gawler: David Phillip, B.Arch. (Melbourne) (Passed a qualifying Exam. approved by the R.A.I.A.), 3 Great Ryrie Street, Ringwood, Victoria, Australia. A. G. Stephenson, J. F. D. Scarborough, Miss Ellison Harvie.

Irvine: John Lindsay (Passed a qualifying Exam. approved by the N.Z.I.A.), 16 Hendry Avenue, Onehunga, S.E.5, New Zealand. Prof. A. C. Light, H. L. Massey, Prof. C. R. Knight.

Lennard: McDonald Douglas, B.Arch. (Rand) (Passed a qualifying Exam. approved by the I.S.A.A.), 25 Wellington Avenue, Sandringham, Johannesburg, S. Africa. Applying for nomination by the Council under Bye-law 3 (*d*).

Meier: Phillip Hilton, B.A. (Arch.) (C.T.) (Passed a qualifying Exam. approved by the I.S.A.A.), c/o Messrs. Andrews and Niegeman, 901 Union House, Queen Victoria Street, Cape Town, S. Africa. O. Pryce Lewis, Prof. L. W. T. White, H. L. Roberts.

Pettit: Robert Eric, B.Arch. (Rand) (Passed a qualifying Exam. approved by the I.S.A.A.), Cranleigh Hotel, 29 Grants Grove, Durban, S. Africa. Applying for nomination by the Council under Bye-law 3 (*d*).

Toomey: James Leon (Passed a qualifying Exam. approved by the R.A.I.A.), 94 Alison Road, Randwick, Sydney, Australia. Prof. A. S. Hook, G. L. Moline, Prof. Leslie Wilkinson.

Watson: John Ramsay, Dipl.Arch. (Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), P.O. Box 677, Nairobi, Kenya, East Africa. L. G. Jackson, H. D. Archer, E. D. Hill.

Obituaries

Henry Spencer Walcott Stone [*F*], President of the Bristol and Somerset Society of Architects, died on 24 October 1951. He was 72 years of age.

A friend of many years and Fellow of the R.I.B.A. has contributed the following obituary:

'Henry Stone was articled to F. W. Roberts [*F*] of Taunton, and was later assistant to C. E. Bateman of Birmingham.

'He had been in practice in Taunton for forty years, and during a very active professional life he designed and left as monuments in Taunton and the neighbourhood a variety of charming and scholarly buildings. Mention should be made of the Leycroft Almshouses, the remodelled Parade Rooms, the electricity offices, and a small but delightful chapel for St. Katherine's School, near Wellington.

'It was, however, in the field of domestic architecture that Henry Stone left his most characteristic work. It is not too much to say that in a variety of houses, large and small, he not only maintained a tradition but gave it the stamp of his own individuality. In the countryside of Somerset his work has been and will continue to be a gracious and pervasive influence.

'At the time of his greatly lamented death he was serving his second year as President of the Bristol and Somerset Society of Architects, and he enjoyed the affection and esteem of its members to a peculiar degree.

'He will long be remembered as an outstanding champion of the dignity and integrity of the profession, and its loss by his death is no less than that sustained by the art of architecture which he practised with such outstanding ability.

'During the 1914-18 war he served in France as a captain in the Royal Engineers.

'His partners, C. G. Toy [*F*] and R. M. Hewlett [*F*] will carry on the practice.'

Jacob Herbert Jones [*Retd. F*], past President of the South Wales Institute of Architects, died at Swansea on 23 August, aged 68.

Mr. C. G. Tagholm [*F*], Hon. Secretary of the Western Branch of South Wales Institute, writes as follows:

'Jacob Herbert Jones, who died at Swansea on 23 August, was born in that town in 1883 and educated locally and in Nottingham. He served his articles with the South Wales firm of J. P. Jones and Rowlands, and thereafter joined the late Charles S. Thomas [*F*] in 1902 as assistant, becoming a partner with the latter in 1908. The partnership enjoyed a considerable general practice, continued under the same style by Mr. Jones himself after the death of Mr. C. S. Thomas until the former's retirement in March 1950.

'Among Mr. Jones's professional appointments were Lecturer in Design and History of Architecture at Swansea School of Art and Honorary Lecturer in Modern Architecture and Member of the Design Jury at the Welsh School of Architecture. He took a prominent part in the proceedings of the South Wales Institute of Architects, being President 1931-33, Chairman of the Western Branch 1928-29, and Hon. Secretary of this Branch for most of the period from its formation in 1919 until 1946.'

John Ivor Price Jones [*A*], Past President of the South Wales Institute of Architects and an early Chairman of the Allied Societies' Secretaries Conference, died on 5 November 1951, aged 74 years.

Among Mr. Jones's more important architectural works are Cardiff Technical College, the Edward Nichol Home, the Central Boys' Club, and the Hope Baptist Church, all of Cardiff; besides business premises for James Howells and Co. Ltd. and for Marments in that city; the Y.M.C.A. building at Merthyr Tydfil, Chepstow Emergency Hospital, an

evacuation hostel at Caerphilly, and a number of country houses.

Mr. C. F. Jones, Hon. Secretary of the South Wales Institute of Architects, writes:

'Mr. Ivor Jones was born in Cardiff and educated at Mill Hill School. He was articled to Messrs. J. P. Jones, Richards and Budgen, Cardiff, of which firm his father was senior partner. Mr. Ivor Jones was elected an Associate R.I.B.A. in 1903, and began in private practice at about that time. He later entered into partnership with Mr. T. E. Richards; this was terminated in 1912. He was then joined by Mr. Percy Thomas. On the dissolution of that partnership in 1936 Mr. Jones took as his partner Mr. John Bishop [*A*], and was active in the practice until the date of his death. During a long and successful professional career he was, in conjunction with his partners, responsible for many important buildings in Cardiff and South Wales.

'Mr. Ivor Jones was keenly interested in the South Wales Institute of Architects, of which he was President from 1919 to 1921. He was Hon. Secretary of the Institute and Hon. Editor of the Annual Report from 1921 to 1944 and 1951 respectively, and was largely responsible for the post-1914 war reorganisation of the Institute and the formation of the three Branches within its framework. His efforts in connection with the Annual Report are reflected in the present financial position of the Institute. He was also keenly interested in the work of the Allied Societies, and was largely responsible for the R.I.B.A. Conference of Allied Societies' Secretaries of which he was the second Chairman. He was an Honorary Lecturer and Examiner to the Welsh School of Architecture for a number of years.

'Mr. Ivor Jones was a Past President of the Cardiff Naturalists' Society, and an early member of the Cardiff Rotary Club. He played Rugby football and hockey for Cardiff, and was a keen golfer until his health prevented him from taking any active exercise.

'Architecture in South Wales is the poorer by the passing of one who was forthright and definite in his opinions, a wonderful organiser, quick in action, and who was, whenever approached, ready to advise the students and younger members.'

James Baird, A.M.T.P.I. [*A*] died on 31 March, at the early age of 38.

His apprenticeship was served with the late firm of Messrs. H. Cook and Hamilton, Paisley, with whom he was engaged primarily on school work and the reconstruction of large dwellings. Later he worked with Messrs. James M. Munro and Son, Glasgow, where he was engaged on work for aircraft manufacturers and other industrial work. His main interest, however, lay in housing, particularly for local authorities, and he thus found employment with the County of Renfrew and later with the Burgh of Rutherglen. From Rutherglen he moved to Belfast where he worked on housing in the Ministry of Health and Local Government. In July 1950 he joined his elder brother, Mr. David L. Baird, B.Sc.(Arch.), in his practice in Paisley. Mr. David Baird will continue to carry on the practice under the name of J. and D. L. Baird.

Alan Dudley Scott [*A*] died on 29 April, aged 41 years.

He was educated at Winchester College, and trained at the Architectural Association School of Architecture. Mr. Scott was in general practice, and at the time of his death was a partner in the firm of Brian L. Sutcliffe and Partners, of Guildford and Southampton. Mr. Scott also held the position of Surveyor to the Guildford Diocesan Dilapidations Board. He was a member of the Council of the South-Eastern Society of Architects, and a Committee member of the Guildford Chapter.

Ariston St. John Diamant [*L*] died on 27 September 1950, aged 73.

Mr. Diamant's native country was Greece, but he was sent to England as a boy to receive his education, and remained here to train as an architect. He then went to Egypt, where his best known architectural works were the public assembly halls of the American University and the English school, both in Cairo. The building of the English school was financed by the King George V Jubilee Fund.

During holidays in England Mr. Diamant restored, modernised and decorated Eastling Manor, the 16th century house in Kent that ultimately became his home. It was there that he died.

Members' Column

This column is reserved for notices of changes of address, partnership and partnerships vacant or wanted, practices for sale or wanted, office accommodation, and personal notices other than of posts wanted as salaried assistants for which the Institute's Employment Register is maintained.

APPOINTMENTS

Mr. Henry Abbott [*A*] has been appointed Architect to the Lleyn Rural District Council, Metro Buildings, Pwllheli, Caernarvonshire, where he will be pleased to receive trade catalogues etc.

Mr. John Biekerdike [*A*] is relinquishing his appointment with the Building Research Station in February to take a post of Senior Lecturer at the School of Architecture, the College of Art and Crafts, Birmingham.

Mr. Alexander Fraser, A.M.T.P.I. [*A*], has taken up the appointment of Town Planning Officer, Department of Survey and Town Planning, Dar-es-Salaam, Tanganyika Territory, East Africa.

Mr. Jason Smith, M.C. [*A*], has taken up an appointment with the Ministry of Works, Architectural Division, Head Office, Stout Street, Wellington, New Zealand.

PRACTICES AND PARTNERSHIPS

Mr. E. R. Collister [*A*] has opened a branch office at 4a Market Street, Cambridge.

Mr. Charles Crichton [*A*] is taking up partnership in the firm of North and Padmore [*F*] in Bangor, North Wales, on 31 January 1952. His private address will be Beamsmoor, Llanfairfechan, Caernarvonshire.

Mr. John E. M. Macgregor, F.S.A. [*F*], announces that he will take into partnership **Mrs. Penelope Adamson** [*A*] and **Mr. John Kemp** [*A*] as from 1 January 1952, and the practice will continue at 53 Great Ormond Street, London, W.C.1.

Mr. C. B. Martindale [*F*] has taken into partnership **Mr. F. Gerald Jackson** [*A*], who has given up his position as Chief Architect to the Corporation of Barrow-in-Furness in order to resume private practice. The practice will continue as heretofore under the style of **J. H. Martindale and Son,** at Cathedral Chambers, Castle Street, Carlisle.

Messrs. W. S. Willan, D. A. Stewart and K. Waite [*F A A*] announce that they have now opened an office at 9 King Street, Dover, where they will be pleased to receive trade catalogues etc. This office is an addition to those at 127 Sandgate Road, Folkestone, and 23 Dane John, Canterbury.

CHANGES OF ADDRESS

Mr. Charles G. Dixon [*A*] is now carrying on business at 42a Shenley Road, Boreham Wood, Elstree, Herts. (Elstree 2363.)

Mr. Brian O'Rorke, A.R.A. [*F*], has moved his office to 15 Chantrey House, Buckingham Palace Road, London, S.W.1. The telephone number, SLOane 0556, is not changed.

The new address of **Mr. I. Shaw** [*F*] is 10/104 German Colony, Jerusalem, Israel.

Mr. E. Brian Tyler [*F*] has removed to Prior House, Westgate, Chichester (Chichester 2406), and has opened a new office at Sudley Chambers, Sudley Road, Bognor Regis (Bognor Regis 470), where he will be pleased to receive trade catalogues.

PRACTICES AND PARTNERSHIPS WANTED

Fellow (56), at present in private country practice, desires association or partnership with practice in East Sussex; near sea preferred; long general experience; would consider part time arrangement. Box 94, c/o Secretary, R.I.B.A.

Member wants to purchase practice in the Southend area. State purchase price and full details. Box 99, c/o Secretary, R.I.B.A.

Fellow would like to hear from practising firm with a view to partnership or position as Senior Assistant leading to partnership. South Africa, Australia, New Zealand or Canada preferred. Box 100, c/o Secretary, R.I.B.A.

WANTED AND FOR SALE

Retired architect has office furniture for disposal; can be seen at Adelphi, W.C.2. Particulars on application. Box 91, c/o Secretary, R.I.B.A.

For Sale. Six unbound volumes of the Town Planning Institute's Journal, XXXI to XXXVII. Also optical square. All in first class condition. Box 92, c/o Secretary, R.I.B.A.

Plan chest, wood or steel, required, up to 5 ft. 0 in. wide. Box 95, c/o Secretary, R.I.B.A. Three screw dumpy level No. 7, tripod, 14 ft. staff and 6 survey poles for sale. Box 96, c/o Secretary, R.I.B.A.

For Sale. Forty copies of the R.I.B.A. JOURNAL from June 1948. Thirty shillings. Box 97, c/o Secretary, R.I.B.A.

ACCOMMODATION

Member requires office accommodation in London, three rooms, one as drawing office. Box 90, c/o Secretary, R.I.B.A.

Offices to let, up to 4,000 ft. or less, in Manchester Square. Box 93, c/o Secretary, R.I.B.A.

Member requires two-room office urgently in London, W. or S.W. Rent about £120. Box 98, c/o Secretary, R.I.B.A.

Associate requires premises S.W.1, W.1, Chelsea or Kensington, minimum 750 sq. ft. to 800 sq. ft. Would be willing to share reception or similar amenities. Box 101, c/o Secretary, R.I.B.A.

Associate would like to hear of a small office to rent, possibly on a shared basis, in or near the centre of Birmingham. Box 102, c/o Secretary, R.I.B.A.